Food and Agriculture Organization of the United Nations

Hisaar Foundation
a foundation for water, food and livelihood security

engro foundation

4th Karachi International Water Conference

Water·Energy·Food NEXUS

Agenda for the 21st Century

Conference Proceedings

26th & 27th November 2019
Karachi, Pakistan

Abbreviations and Acronyms

AMU	Aligarh Muslim University
BIPP	Burki Institute of Public Policy
Cap-Net	Capacity Development in Sustainable Water Management
CASI	Conservation Agriculture for Sustainable Intensification
CISRO	Commonwealth Scientific and Industrial Research Organization
CPEC	China Pakistan Economic Corridor
DFAT	Department of Foreign Affairs and Trade
EPA	Environmental Protection Agency
FAO	Food and Agriculture Organization
GWP	Global Water Partnership
IBA	Institute of Business Administration
ICARDA	International Center for Agricultural Research in the Dry Areas
ICIMOD	International Centre for Integrated Mountain Development
IRSA	Indus River System Authority
IWMI	International Water Management Institute
IWRM	Integrated Water Resource Management
KIWC	Karachi International Water Conference
KUL	Karachi Urban Lab
LUMS	Lahore University of Management Sciences
NBP	National Bank Pakistan
NED	University Nadirshaw Eduljee Dinshaw University
NGO	Non-Governmental Organization
NVP	National Volunteer Program
OAKS	Old Associates of Kinnaird College
OECD	Organization for Economic Co-operation and Development
PHWI	Panjwani-Hisaar Water Institute
PWP	Pakistan Water Programme
SDGs	Sustainable Development Goals
SIDA	Sindh Irrigation and Drainage Authority
SIDCL	Sindh Infrastructure Development Co. ltd
SMB	Sindh Madressah Board
TMF	Thardeep Microfinance Foundation
UBL	United Bank Limited
UWN	Universities for Water Network
WAPDA	Water and Power Development Authority
WEF	Water Energy Food
WIN	Water Integrity Network
WWF	World Wildlife Fund
WWN	Women and Water Network

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Foreword

The Karachi International Water Conference (KIWC) is now considered a well- established and "must attend" water event in the country. Much like other global high profile conferences like ones in Stockholm, Singapore and Budapest, we are hoping that KIWC one day will also achieve a similar place on the global stage. This year's theme focused on the "Water-Energy-Food Nexus" a critical approach to adopt to fulfill Pakistan's agenda in the 21st century, owing to the increased demand for scarce water resources between competing uses and sectors. The 4th KIWC succeeded in generating healthy discussions, innovative potential solutions and pathways for adopting the nexus approach through the various lenses of water governance (political perspective), infrastructure and investment (economic perspective), valuing water (cultural perspective) and leaving no one behind (social perspective).

This year, we tried to be different. The 4th KIWC had fewer concurrent sessions, which allowed us to deliver sessions that were richer in content, higher on visibility and larger in attendance than in the past. We also experimented with different formats for our sessions this time, with one session in the form of a fireside chat with a leading personality and another in the style of world café with various experts discussing unconventional topics. This 4th KIWC also stood apart in terms of the support and participation it received from international organizations such as International Water Management Institute (Sri Lanka), Water for Food Institute (Nebraska), World Bank, Food and Agriculture Organization, and Water Integrity Network (Berlin). Hisaar Foundation also continued the trend it had set in its inaugural conference in 2013 of delivering on its promises and commitments. Thus our Conference Declaration reiterates its commitment to the establishment of the Panjwani-Hisaar Water Institute and remains a dynamic force to be acted upon in good faith and action-oriented.

It makes us very happy to see the growth of this conference over the years and fulfillment of its lofty aspirations. We introduced this conference in 2013 in an environment when water was not a stated priority of the government and when many discouraged us, given the prevailing security situation in Pakistan. But we soldiered on and were able to deliver on our commitments because the cause of water was very important not only to us but to the whole nation and this region. We had the belief that the support and attention for this type of conference will be forthcoming from the stakeholders who were also hoping for such an intervention.

Hisaar Foundation is seen as a neutral platform welcoming diverse viewpoints and players and welcoming of all the stakeholders regardless of their shape, size and color. For the success we have achieved in this regard, the support and encouragement provided to the Hisaar Foundation team by its Board of Governors and Council members was highly instrumental. Similarly, the members of our Think Tank for Rational Use of Water and the Universities for Water Network were also key players in helping us reach this stage. Our work on water policy has also borne fruit, as people accepted our initiative in the 'citizen's water policy' which reflected the aspirations of the common man, and subsequently the Implementation Framework for Pakistan's National Water Policy has also been accepted and lauded by the highest government circles and is being owned by the Ministry of Water Resources itself.

The success of this conference was also due to the active participation of noteworthy and high profile speakers and delegates. This conference was inaugurated by the honourable President of Pakistan, Dr. Arif Alvi and the Governor of Sindh, Mr. Imran Ismail was the Chief Guest of the Closing Plenary session. We are especially thankful to our guests, such as, Dr. Illangovan Patchamuthu and Dr. William Young (World Bank), Ms. Mina Dowlatchachi (FAO), Dr. Roberto Lenton (University of Nebras-

ka), Dr. Adil Najam (Boston University), Dr. Barbara Schreiner (Water Integrity Network), Dr. Geoffrey Shaw (Australian High Commissioner to Pakistan), Dr. John Dore, Dr. Mac Kirby (Australian Department of Foreign Affairs and Trade), Dr. Reza Baqir (Governor, State Bank of Pakistan), Dr. Mohammad Qazilbash (Oxfam Pakistan), Mr. Ghias Khan (Engro Corporation), Mr. Ahmed Kamal (Federal Flood Commission), Mr. Arif Usmani (National Bank of Pakistan), Mr. Samar Ali Khan (Former MPA), Mr. Favad Soomro (Engro Foundation), Ms. Nadira Panjwani (Panjwani Charitable Foundation), Dr. Sarosh Lodi (Vice Chancellor, NED University) and many others.

We look forward to 2021 with high hopes and expectations with our continued aspiration for better and more valuable contributions to the state of water in this country.

Zohair Ashir

Chair, Steering Committee

Purpose of the Conference

The OECD Environmental Outlook for 2050 projects that global demand for energy will increase by 80% and by 55% for water. In addition FAO estimates a 60% increase in food demand over the same period.

Agriculture accounts for 70% of total global freshwater withdrawals, making it the largest user of water. Water is used for agricultural production, forestry and fishery, along the entire agri-food supply chain, and it is used to produce or transport energy in different forms[1]. At the same time, the food production and supply chain consumes about 30 % of total energy consumed globally[2]. Energy is required to produce, transport and distribute food as well as to extract, pump, lift, collect, transport and treat water. Cities, industry and other users, too, claim increasingly more water, energy and land resources.

Population growth, economic development and climate change will accelerate competition for food, water and energy. Humanity is currently using nature 1.75 times faster than our planet's ecosystems can regenerate. The costs of this global ecological overspending are stupendous. How can we use resources of the planet to allow 9 billion people to live well within the limits of the planet? The last century was about growth and essentially putting carbon into the atmosphere, the result of that is the climate emergency we are facing. The direct impact of climate change is on the water cycle and we have observed increased incidents of massive storms, floods, droughts and sea rise across different climatic zones.

1 FAO. 2011a. Forests for improved nutrition and food security. Rome. www.fao.org/forestry/ 27976-02c09ef000fa99932eefa37c-22f76a055.pdf.
2 FAO. 2011b. Looking ahead in world food and agriculture. Perspectives to 2050, by P. Conforti. Rome. www.fao.org/docrep/014/i2280e/i2280e00.htm.

Urbanization and population growth exert pressure on the system. Closer to home, while Pakistan does not have a street population in our cities as we see on the streets of Calcutta or Dhaka, we do have high levels of malnutrition and child stunting. USAID reports approximately 60% of the Pakistani population is facing food insecurity and Pakistan Demographic Health Survey (PDHS) 2017-2018 indicated, 38% of all children under five are stunted.

Women and girls, and the way they are impacted by access to water, food and environmental entitlements constitute a large part of the picture, and most importantly a large part of the solution. With the Sustainable Development Goals, and the Paris Agreement we have some good frameworks in place. Achieving the SDGs is directly related to the sustainable use of land, food, water and energy resources. We can look at the WEF Nexus as the central pillar of Agenda 2030.

In the wake of these movements we are now discussing what no one would have dared to say just a few months before. The Guardian recently listed the 20 fossil fuel companies whose relentless exploitation of the world's oil, gas and coal reserves can be directly linked to more than one-third of all greenhouse gas emissions in the modern era, ARAMCO topping the list. It has been revealed by Forbes that the 120 plus richest individuals in the world spend only 3.76 % of their net worth to charity. There is now a value being put on the quantum of investments needed to counter the climate impact on water, and commitments from these 120 plus individuals can make a difference in alleviating the impacts of climate change safeguarding water.

Pakistan has embarked on ambitious tree planting and recharging campaigns, but the correct focus on water as the key to managing threats to life and the recognition of the 'water' economy as the driver of Pakistan's economy is yet to be adopted by the government. Hisaar Foundation's work in the last 18 months has been to link both with these global movements, and link with government at different levels, connecting to the real problems that people are coping with at the grassroots. We have to work collectively to address these challenges to arrive at 2030 we are aiming for.

Simi Kamal

Chair, Academic Committee

Message from his Excellency

President of Pakistan

Dr. Arif Alvi

Pakistan is facing a water crisis and some forecasts have predicted dire consequences to our socio-economic lifeline unless we urgently devise appropriate strategies on water. As the President of Pakistan, I have chosen water as one of my main areas of focus and keenly support initiatives aimed at providing short and long term solutions to Pakistan's water problems.

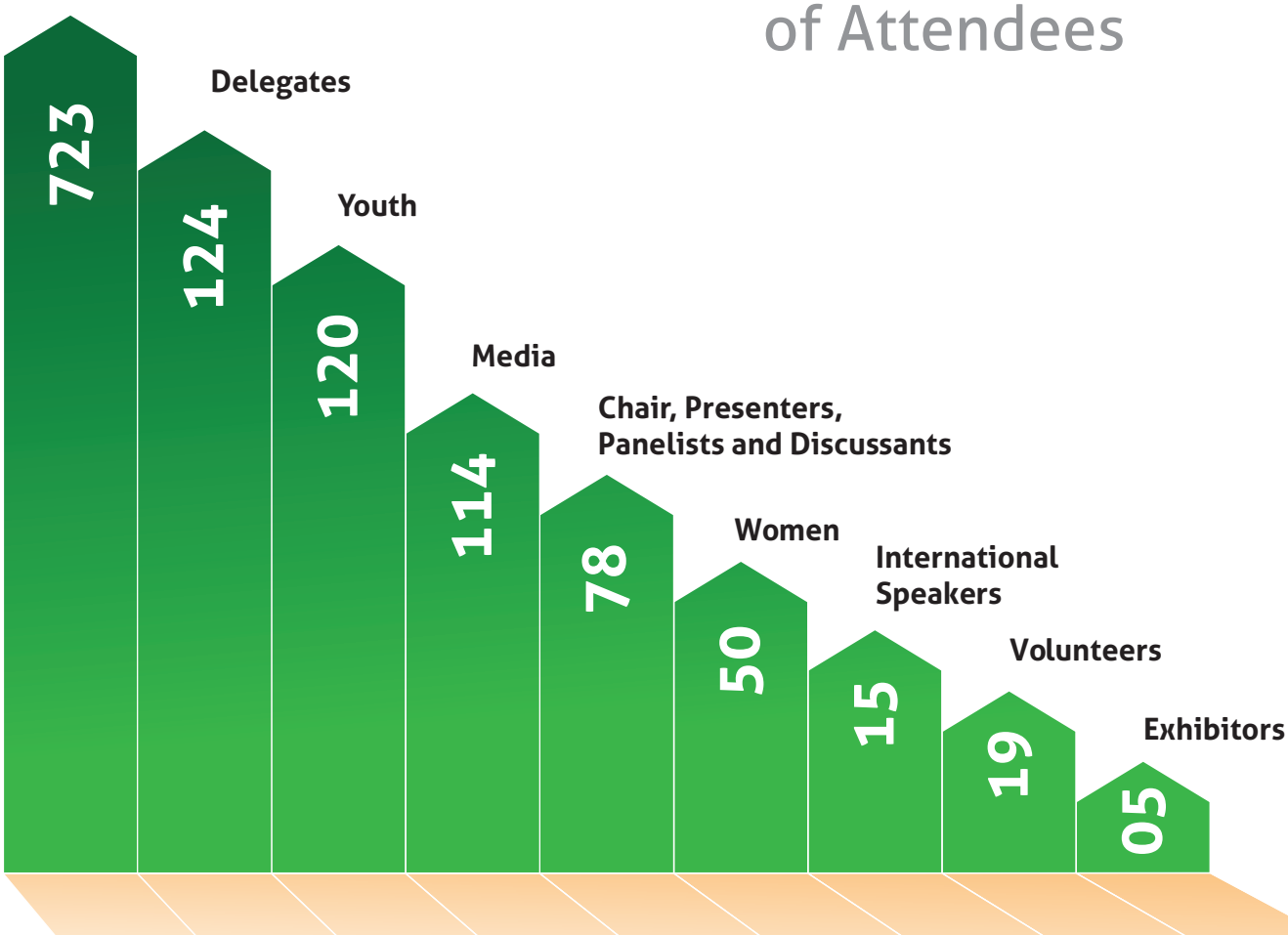
We live in a time, where our children are rightfully holding us accountable for our mistakes in failing to take care of the environment. They expect us to protect natural resources and leave them a legacy on which to build a water sufficient society with equitable rights and obligations. Pakistan's water problems are part of global trends and I make a special appeal to all the stakeholders, especially the international water experts, academics and professionals to engage with us in an open and wide ranging water discourse. Your views and experiences will help us in developing an effective water strategy to cope with Pakistan's water challenges.

I am pleased to learn that Hisaar Foundation has chosen water linkages with food and energy as the main theme of this conference. I look forward to inaugurating the 4th Karachi International Water Conference – Water-Energy-Food Nexus: Pakistan's Agenda for the 21st Century – on November 26th and November 27th, 2019.

In particular, we would like to welcome our international delegates and experts to this conference and assure you that you will find the discourse and this event useful and informative.

I congratulate Hisaar Foundation for arranging this biannual conference which has become a signature event in not only Pakistan's water calendar but also on the global scene.

Summary
of Attendees



Conference Statistics

26th and 27th

November Conference Successfully Held

13

Sessions

5

Pre Conference Sessions

1255

Attendees

President of Pakistan

Chief Guest

Day1

Governor Sindh

Chief Guest

Day2

15

Sponsoring Organizations

8

Exhibitors

Social Media

Conference HashTag

#4KIWC #WEFNexus

Facebook live video

Over 2000

views

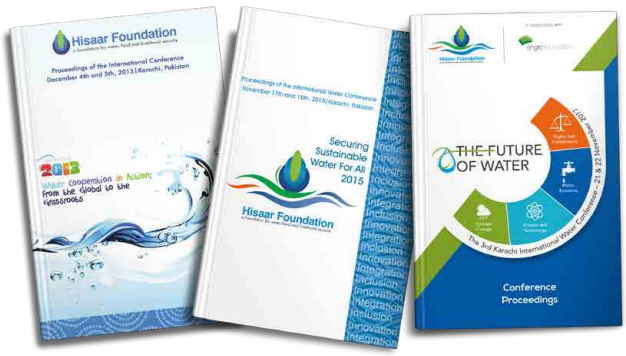
Feedback

Conference Background

The Genesis & Growth of KIWC

The Karachi International Water Conference (KIWC) takes place in Karachi every two years. Over the past six years, it has evolved and attained a position of prominence as a "must attend" major water event in the region. The Conference provides a neutral platform for people from all walks of life to come together and engage in discourse, deliberations and debate a wide variety of water related topics, challenges, issues and solutions from international, regional and Pakistan perspectives. Participants share insights, knowledge, research findings and innovations.

From modest beginnings in 2013, when the first conference was attended by about 700 delegates mostly from Karachi, The conference has grown in size and stature and now elicits interests from far and wide. The Third Karachi International Water



Conference was attended by over 1200 delegates from Pakistan, South Asia, Middle East, Europe and North America. From local organizations to multinationals, to bilateral and multilateral bodies; prominent personalities in the water sector have attended the previous conferences. The profile of this fourth conference was raised further with greater involvement of international organizations, agencies and practitioners from energy, renewable energy, agriculture, food and nutrition sectors.

The Centrality of Water-Energy-Food Nexus

The centrality of the Water-Energy-Food (WEF) Nexus is now recognized as an appropriate analytical tool, a measure for reality check and as a strategy for practical outcomes. The demand for water, energy and food is increasing, driven by a rising global population, rapid urbanization, changing diets and economic growth. Agriculture remains the largest consumer of the world's freshwater resources, and more than one-quarter of the energy used globally is expended on food production and its supply. As the world gears up to achieve the Sustainable Development Goals (SDGs) by 2030, thinking in terms of the Water-Energy-Food Nexus is the need of the hour.

Conference Objectives

The conference aims to bring together thought leaders, actors and players of the water sector that are working on Water-Energy-Food nexus and related areas. Major global, regional and national organizations and their representatives, researchers, professionals, decision-makers, business innovators, practitioners, experts, women's groups, youth

groups and leaders on WEF nexus will exchange ideas, foster new thinking, develop innovative solutions and work on the water agenda for the 21st century.

Conference Outcomes

By the end of the conference we expect to see the emergence of a research agenda on WEF nexus, pledges of government and people working together and working relationships connecting developed and developing countries to address our common heritage.

Conference Themes

The Water-Energy-Food nexus will be explored through the various lenses of valuing water, water governance, water infrastructure and investment, and social inclusion (gender and youth).

Delivering water, energy and food for all in a sustainable and equitable way is one of the major challenges faced by our societies. The conference will explore these themes and provide the knowledge needed to understand how interactions between water, energy and food are shaped by environmental, economic, social and political changes and how the synergies and trade-offs among them can be better planned and managed.

Valuing Water

Water is arguably the most precious resource on Earth. However this fact is yet to be captured when we begin to value water. The price of water traditionally reflects a limited set of costs to treat and transport water, but the value of water is far greater. From the human rights perspective low and subsidized water prices are essential to ensure that the human right to water is met, however keeping this price for all results in exploitative use, freshwater contamination and inflicts costs upon all economic dimensions as well as the environment.

Water underpins all aspects of development as is evident from water being vital to all of the 17 SDGS. Its multifaceted usage makes it difficult to quantify its value as different stakeholders conceptualize and describe its values differently yet all of them have a legitimate claim on water and its usage. Therefore it is essential to employ a nexus approach to understand the cross functionality of water in other sectors such as agriculture and en-

Hisaar Foundation Conference team

ergy and negotiate these different ways of valuing water as a finite resource. Valuing water and introducing costs towards misallocation, wastage and pollution of water will encourage effective usage of this scarce resource.

Water Governance

Water governance refers to the political, social, economic and administrative systems in place that influence water's use and management. It determines the equity and efficiency in water resource and services allocation and distribution, and balances water use between socio-economic activities and ecosystems.

Governing water includes formulation of water policies, legislation and establishment of institutions to implement these. Well defined roles and responsibilities of government, civil society and the private sector in water resource management make these policies effective and improve institutional performance. Good water governance is integral for the rest of governance initiatives to succeed. According to the World Bank estimates, some regions could see their growth rates fall by as much as 6% of GDP by 2050 as a result of water-related losses in agriculture, health, income, and property and be sent spiraling in a sustained negative growth trap.

Water governance is affected by decisions and factors outside of the water sector such as agriculture and energy. The supply of water cannot be effectively and sustainably managed unless the complex relationship between these sectors are fully recognized and explored. Too often the sectoral policies and goals are created in silos. For Pakistan and the regional water sector, the need for 'integration of policies' within a nexus framework is urgent and warrants recognition from the government.

Water Infrastructure and Investment

The FAO has projected that an estimated USD 960 billion of capital investment is required to extend and improve irrigation between the years 2005/07 and 2050 in 93 developing countries. Such investments are needed not only for new water infrastructure but also in operations and maintenance of the existing ones in order to improve their efficiency and reduce water loss. Due to the interlinkages of water agriculture and energy, policies outside of the water sector can stimulate water-wise investments when

they factor in the costs of reduced water risks. Investments into economic development for water, food production and energy security infrastructure must complement nature and ecosystem for creating a sustainable green economy.

Strengthening the enabling environment for driving water investments requires well-designed regulations, competition policy, financial market policy, dedicated investment promotion and facilitation, and improved public governance. International co-operation as well as national and local policies aimed at the broader investment environment need to be supplemented by a dedicated set of policies that promote water investment. Governments should incentivize leveraging of public funds with commercial finance.

Leaving No one Behind-Social Inclusion

Access to clean water, modern energy services and sufficient food supply is fundamental for reducing poverty and achieving the Sustainable Development Goals. To meet the needs of those people with limited access to these three resources and rising demand in rapidly developing regions it is necessary to address water, energy and food issues jointly, because choices and actions in any of these domains can significantly impact the others. Policies and water management decisions which also manifest in agriculture and energy sectors affect everybody, and they should therefore be determined with inclusive and participatory processes to reflect the diversity of communities.

Women comprise just less than half of the population of Pakistan and youth makes up 65% of the country's population yet youth and gender mainstreaming is not well researched and understood. Monitoring and evaluation processes are not developed enough to reveal the true gender and inclusion power dynamics that occur within the resources management context. Furthermore, there is a need to better understand and account for a broader range of factors that can lead to exclusion and marginalization, such as age, disability, ethnicity, caste, and sexuality, if we are to ensure that no one is left behind.

Conference Declaration

Panelists for Opening Plenary Session with the President of Pakistan.

We celebrate the success of the Fourth Karachi International Water Conference. It brought together a diverse range of stakeholders, especially women's groups, youth, regional, national and international organizations, researchers, professionals, decision-makers, business innovators, practitioners, and experts.

The conference considered the 'original' Water-Energy-Food concept applied to water security (access and supply), food and energy with water holding center stage. The Nexus approach allows exploration through the prism of valuing water, food, social and economic inclusion (gender and youth), water governance, water infrastructure, and investment. Delivering water, energy and food for all in a sustainable and equitable way is one of the major challenges faced by society.

The conference explored these themes, and we believe the aim must now be to build on the ideas and solutions and keep up the momentum to bring the Water Energy Food Nexus to a wider audience, foster thinking, develop innovative solutions and work towards greater implementation of the water agenda in 21st century Pakistan. Such further engagement will see the emergence of an agenda for research, policy and action on WEF nexus and connections created between developed and developing countries.

The conference noted the disconnect between practice and academia as well as between the work of NGOs and the private sector. We need to value the work on the ground done by NGOs as well as those relevant solutions developed by the private sector. However, all stakeholders' practices should align to the objectives and principles of the national policies on water and food security.

We believe the lessons from the Murray-Darling basin continue to be relevant for the Indus Basin and will enhance our linkages with the Australian Government to ensure continued mutual learning. We are opening a new chapter with Australia; it faces and has faced similar challenges which it has managed successfully.

The conference recognized the pivotal role of gender in the food and energy nexus. Women are needed in policy making at all levels of the water sector as guarantors for water reforms. Women

and girls, and the way they are impacted by access to water, food and environmental entitlements constitute a large part of the picture, and most importantly a large part of the solution.

The conference recommends continued water discourse with young people, girls and boys taking due care in closing the digital and gender gap. We pledge to develop committed water professionals and mainstream young people in the water sector.

We can look at the WEF Nexus as the central pillar of the Sustainable Development Goals agenda and recognize its usefulness in addressing competing priorities.

The conference recognized the essential role of citizen's groups in bringing the debate on water to the forefront. We all know the challenges, now we must focus firmly on solutions. As the water crisis grows, we will continue to double our efforts. Pakistan has risen to the challenge before, and we can do it again. People accepted the 'citizen's water policy' because it is realistic and precise, with clear goals and timeframe.

We have seen growing concern and response from the government. We welcome the support, interest and commitment of the President of Pakistan and Governor Sindh, and urge them to take these recommendations to all levels of provincial and federal government.

This conference calls for the coordination and implementation of, people-centric provincial and national policies using the following principles:

1. Base strategies on a mutually agreed evidence base
2. Ensure cost-effectiveness
3. Improve governance and institutional capacity at all levels
4. Adapt responses to local conditions
5. Ensure policy alignment between water, energy, agriculture, food security and environment

Anticipate change through robust decision making and adaptive management

Ms. Meher Noshirwani presenting the conference declaration.

The Hisaar Foundation pledges:

We will continue deepening and strengthening the dialogue among different stakeholders and promoting data-driven inclusive solutions

The Panjwani-Hisaar Water Institute will foster multidisciplinary integrated research with relevance to the Water-Energy-Food nexus and produce the person-power required to face the water challenges of the 21st Century.

Conference Proceedings

Water-Energy-Food Nexus – Agenda for the 21st Century

Session 1- Plenary

Facilitator	**Mr. Zohair Ashir**, Governor and Member Think tank, Hisaar Foundation
Co-Facilitator	**Mr. Wasif Rashid**, Communication Consultant
Chief -Guest	**H.E. Dr. Arif Alvi**, President of Pakistan
Presenters	**Mr. Ashraf Kapadia**, Chairperson, Hisaar Foundation
	Ms. Simi Kamal, Founder and Chair Academic Committee, Hisaar Foundation
	Mr. Ghias Khan, Chief Executive, Engro Corporation
	H.E. Dr. Geoffrey Shaw, Australian High Commissioner to Pakistan
	Dr. Roberto Lenton, Professor Emeritus, University of Nebraska

The opening plenary focused on the formal opening of the conference, presenting the purpose of conference, an introduction of the nexus concept, the thematic focus (water governance and security, water infrastructure and investment, leaving no one behind and valuing water).

The session was sponsored by Hisaar Foundation & Engro Foundation

Opening Plenary Guest and Delegates

Opening Remarks

The session commenced with Zohair Ashir welcoming panelists and participants, and introducing the theme of the 4th Karachi International Water Conference: The Water-Energy-Food nexus. He said that the objective of the conference is to bring professionals, academics, government officials and civil society together, to discuss the most pressing issues surrounding water in Pakistan.

Welcome Address by Chairperson

The first speaker, Ashraf Kapadia, Chairperson, Hisaar Foundation reflected on the interaction between the natural environment and human activi-

ties, and presented Hisaar Foundation's key ongoing projects, including the Universities for Water Network and the Think Tank for the Rational Use of Water. He urged the audience to change the way that we plan, manage and value water, adding that "water is life, and it is everyone's responsibility."

Purpose of the Conference by Ms. Simi Kamal

Purpose of the Conference in the Context of the WEF Nexus

Ms.Simi Kamal, Founder of Hisaar Foundation presented the purpose of the conference, to bring together thought leaders and assist in a nationwide shift in thinking about the WEF nexus. She added that the conference aims to focus on water as a tool of analysis and paradigm, and to create an agenda for policy, plans and action. She also reflected on the role of women in the nexus, and encouraged their inclusion as part of the solution.

Water in Pakistan: Challenges and Potential Solutions

Next, Mr. Ghias Khan, Chief Executive of Engro Corporation addressed the audience, and presented the challenges and potential solutions to water in Pakistan. He reflected on Engro's work in the ar-

Mr. Ghias Khan speaks on the water challenges and potential solutions in Pakistan

eas of water shortage, water inefficiency and water quality, sharing findings and introducing ongoing projects in this sector. The solutions presented included desalination, drip irrigation and water trading, as well as wastewater management.

H.E Dr. Geoffery Shaw reflects on the Australian experience in water management

Address by H.E. the Australian High Commissioner

Mr. Khan's presentation was followed by remarks from HE Dr. Geoffrey Shaw, Australian High Commissioner to Pakistan, who reflected on Australia's experience in water management. Dr Shaw found

that many of Australia's water security and scarcity problems are similar to those in Pakistan, and it is important to advocate for tools, mechanisms and policy frameworks which can be adapted to climate change. He posits that sharing information about water systems and creating water partnerships will improve overall urban water management. Australia has been working with Pakistan since the 1980s with the Indus River System model, groundwater management research, and agricultural reform, and is committed to continue advancing these partnerships. In the Australian experience, infrastructure-based solutions are not as effective as collaborative efforts which build consensus and balance competing social, political and environmental interests. He concluded by remarking that Pakistan and Australia have a shared love of cricket, as well as a shared interest in water.

Perspectives on the Water-Energy-Food Nexus: Agenda for the 21st Century

Dr. Roberto Lenton presented the keynote address, introducing the Water-Energy-Food nexus as principles under the Sustainable Development Goals (SDGs). He discussed the nature of the SDGs as being people-centred, universal and interconnected, requiring integrated responses and partnerships. The WEF nexus, like the SDGs, are independent but interrelated, and depend largely on one another. Despite the nexus manifesting itself in different ways, the negative impacts on any part of the nexus significantly impact others. He discussed this link through the use of two examples, the Nebraska Agricultural Water Management Network (US) and the Karshi Lift Irrigation Scheme in Uzbekistan, which reflect a shift from subsidizing energy to water saving technologies. He concluded that a good agenda for the 21st century challenges must include a large focus on integrated systems and partnerships.

Address by H.E. the President of Pakistan

Dr. Lenton's keynote speech was followed by an address by the Chief Guest, H.E. President of Pakistan, Dr. Arif Alvi. While showing concerns on implications of global warming, the President said that a network of partnerships on water and food security is the need of the hour involving the private sector, government, civil society, media and people of Pakistan. "We live in a time, where our children are rightfully holding us accountable for our mistakes in failing to take care of the environment. They expect us to protect natural resources and leave them a legacy on which to build a water and food sufficient society", he added. President Alvi congratulated Hisaar Foundation for arranging this biannual conference and thanked all international delegates and experts for their informative discourse on food and water security. He advised the organizers to invite the agriculture and water Ministers of four provinces including Federal Ministers in the next conference to give government ownership to this agenda. He added "These Ministries can take a leading role in devising solid strategies to avoid the risks of drought and flood like disasters in the country."

Address of the Chief Guest H.E. President of Pakistan Dr. Arif Alvi

Valuing Water – Harnessing Energy and Food Production

Session 2A-Plenary – Moderated discussion

Moderator	**Ms. Simi Kamal,** Founder and Chair Academic Committee, Hisaar Foundation
Presenters	**Dr. John Dore,** Lead Water Specialist, Australia's Department of Foreign Affairs and Trade
	Mr. Shahid Ali Lutfi, Environment Consultancy Services, ATC Holdings
	Mr. Mayura Boutejue, Wind Energy Specialist
	Mr. Mahmood Nawaz Shah, Agriculturalist and Member Think Tank, Hisaar Foundation
	Mr. Tariq Qaiser, Architect and Environmental Activist
	Dr. Abida Farooqi, Assistant Professor, Quaid-e-Azam University

This session aimed to examine the centrality of water in the water, energy and food nexus with theoretical underpinning of nexus concept through the global application of nexus concept and the examples from Pakistan, localizing water, energy and food security.

The session was sponsored by ATC Holdings

Opening remarks

Continuing from the opening plenary Ms. Simi Kamal discussed the WEF nexus Approach and briefed the participants on session proceedings which consisted of a keynote address on the WEF nexus followed by two separate panel discussions with experts.

Panel discussion part 2 moderated by Ms. Simi Kamal with Mr. Tariq Qaiser, Mr. Mahmood Nawaz Shah

Conference Proceedings

Keynote speech on the Water Energy Food Nexus by Dr. John Dore

Keynote Speech

The keynote speech by Dr. John Dore started off by sharing how Australia and Pakistan have signed a memorandum of understanding for collaboration on water, food and energy. He highlighted that any strategy that focuses on one part of the WEF nexus without considering its interconnections risks serious unintended consequences. The WEF nexus promises integration of multiple sectoral elements, a better transition into green economies and sustainable development. He added that climate change would further amplify the negative impacts and we have so much existing theory to work with, so it is necessary that we start applying it right now. He presented four different case studies on the applications of the WEF nexus: First, the integrated assessment in HinduKush Himalaya project that brought together a diverse set of professionals, such as energy specialists, economists and water professionals from eight countries who combined their analysis into one process. Dr. Dore expressed that it is one high quality effort at bringing different disciplines together and actively searching for the connections. He shared the second case study on integrated assessment in Mekong River(MRC) across 6 rivers. This integrated assessment catapulted into understanding all the 26 countries and all the issues involved rather than the hydro sector, running their own race. He added that it has been an integrated process that has used water, food and energy as a way to get people to the trail. He added that the third case study, CASI Eastern Gangetic Plains conservation agriculture adopted the WEF nexus as the lens of analysis instead of just an agriculture project. The last case study he shared focused on Bangladesh's partnership for cleaner textile. Dr. Dore said that by stepping into partnership and consensus building, getting governments, NGOs, the fashion houses that are actually selling products across the world to think about the health of the industry that is driving their business, a system of measurement was brought in highlighting real evidence on the nexus elements.

Panel 1 Discussion

Mayura Boutejue discussed that there are a lot of challenges in adoption of renewable energy technologies in WEF nexus context and a lot of wastage as well. With the new technologies, especially in the field, there is a lot of potential. He discussed the wasteful use of water in agriculture and stressed on adoption of water conservation. Salinisation issues


Panel discussion part 1 moderated by Ms. Simi Kamal with Mr. Shahid Ali Lutfi, Mr. Mayura Boutejue and Dr. John Dore

in the delta have to be addressed for survival of local fisheries.

He commented that today we have renewable energy technology (wind and solar) and we want to seek renewable energy dominance in the grid and so on. As these are intermittent, we cannot regulate these two and that is where hydro-power comes in because one can regulate it and when wind and solar is down, hydro comes in for a stable grid. Dams are for multipurpose use therefore, they are a very important element in turn integrating it with wind and solar.

He was of the view that there has been reluctance to embrace wind and solar energy in the region, whereas solar is the future. Pakistan has enormous solar energy resources. The challenge lies in convincing the conventional mindset and bureaucracy to shift from fossil fuels and adapt to new fields of renewable energy generation, with distributive generation, so that the small scale energy production can be connected to the grid.

Shahid Ali Lutfi presented on industry water reuse. He explained that water recycling is mandatory in many countries as it is one of the significant ways of conserving water. He introduced the MBR technology, where the activated sludge combined with a membrane system and water is treated with reverse osmosis technology for reuse. He spoke about adoption of this technology for grey water and processed water which is of high quantity for instance in the textile industry where the water consumption is high. He described how water obtained from recycling with MBR technology is also cost efficient as compared to water supplied through KWSB and commercially.

Questions and Answers

Simi Kamal opened the floor to questions and asked Dr. John Dore whether the nexus is just a theoretical construct and does the WEF Nexus help in valuing water appropriately. He replied that the Nexus is a practical approach and is a way of ensuring that the different values of water are brought forward. The nexus conversation is a way of bringing in the right people together which is beneficial.

The panelists were asked that the Australian EPA and regulations are mostly modern user centric. How can these be guided into Pakistan's regulations? Simi Kamal gave the example of technology adoption by the Australian farmers for conservation agriculture, such methods have been introduced here and individual farmers are piloting it however we need public private partnerships to scale these.

Questions and Answers sessions with the audience

Mauyra Boutejue was asked if there is any small-scale affordable water saving technology that could be used by small land holders? He replied that this is happening in Pakistan, Tharparkar by using groundwater supplementation dams for agriculture and there is a huge potential in Pakistan for this.

Another participant brought forward the issues handling a variety of industrial wastewater reuse and whether water trading brings in efficiency. Shahid Lutfi explained that wastewater reuse technolo-

gy such as MBR is customized industry wise and made to comply with international standards. Dr. John Dore elaborated that only a portion of water in Australia is traded however this is driven by economic rationality where the social considerations have been brought up and being currently debated in Australia.

Panel 2 Discussion

The second panel started with Tariq Qaiser showing his video "The Edge of Delta", highlighting the decline of the river Indus delta and the mangroves. He was inspired to make this video to save the memory of the environment for his grandchildren. He spoke on the Bundle island and Khipriya wala deltas, both slated for development. They both have an incredible collection of trees and the mangroves ecosystem services here have to be protected.

Next, Mahmood Nawaz Shah said that the Indus delta is forgotten, and we mostly think about water in the barrages only. Now we need to move forward from listening to the water experts only. He gave the example of Keti Bandar and how people are not living there anymore due to water shortages. He highlighted that sedimentation in the Indus delta is a major issue as well. He talked about the need to save the delta and the mangroves. Due to these issues and problems the farmers in the area are losing their livelihoods.

Dr. Abida Farooqi highlighted how they challenged a research where initially a group of French researchers reported that around 85% of Pakistan's water has arsenic contamination and it was flawed because the samples were only 1400 from all over Pakistan. Therefore, they collected 3000 samples from Punjab alone and found out that almost 75% of water in Punjab is arsenic free. Her study concluded that 60 million people are using contaminated water with arsenic, which is a threat to Pakistani economy. Due to arsenic concentration in water,

Panel discussion part 2 Dr. Abida Farooqi presenting on Nexus in Practice

the rice crop is contaminated and she suggested adopting the sprinkler irrigation system for reducing the uptake of arsenic.

Questions and Answers

Tariq Qaiser was asked what can we do to save the mangroves of the delta, he suggested that nature reserves and wetland water treatment plants should be created and development should be controlled. We have to raise awareness on these assets and their benefits. We need the young people to talk about these issues and demand that these forests are protected. The participants asked if any such authority for applying water quality standards for industry exists for industrial water use, Simi Kamal replied that we still have to adopt such standards and suggested the use of certifications.

Leaving No One Behind – Café of the Unheard

Session 2B - Open dialogue between experts and participants

Facilitator	**Mr. Wasif Rashid,** Communications Consultant
Chair	**Mr. Zohair Ashir,** Governor, Member Think Tank, Hisaar Foundation
Presenters	**Dr. William Young,** Lead Water Resource Management Specialist, World Bank
	Dr. Roberto Lenton, Chair, IWMI Board of Governors, Professor Emeritus,University of Nebraska
	Ms. Barbara Schreiner, Executive Director,Water Integrity Network
	Mr. Samar Ali Khan, Chairman SIDCL
	Ms. Seema Taher Khan, CEO, Airwaves Media & Member Think Tank, Hisaar Foundation
	Mr. Ahmed Rafay Alam, Water Law Expert & Member Think Tank, Hisaar Foundation
	Mr. Jamal Ansari, CEO Akbar Associates & Member Think Tank, Hisaar Foundation

The session was designed for participants to directly engage in conversation with experts about water issues and topics preselected by the participants/audience. It provided the opportunity for participants to speak and be heard by professionals and experts.

The session was sponsored by Hashoo Foundation

Participants were divided into four groups on the four topics identified as follows, and partnered with experts to discuss themes and challenges that are typically not included in the WEF nexus narratives.

Round Table Discussion

The Politics of Water: IRSA and Indus Water Treaty. This group discussion was led by Advocate Rafay Alam and Mr. Samar Ali Khan. Participants focused on two main provincial disputes between Balochistan and Sindh, and Punjab and Sindh. The former reflected on water measurement and management, while the latter discussed the use of link canals. Participants noted that water management in Pakistan is typically limited to the Indus Basin, and Balochistan therefore is excluded from policy dialogues. It was noted that provincial interests are in conflict with federal interests, which has negatively affected drinking water supplies in urban and rural areas. Participants also raised concerns regarding the lack of data, and the lack of transparency with which decisions regarding water are made at the federal and provincial levels.

Groundwater Depletion: This group was led by Dr. William Young. Participants identified two main challenges relating to groundwater in Pakistan as depletion and contamination. It was noted that

Group discussion on Groundwater Depletion

water management typically focuses on means to better irrigation systems, however groundwater requires different approaches and ways of thinking. Institutional reforms require a better understanding of the nature of groundwater before effective management policies can be implemented, including better measurement and monitoring tools.

Group discussion on Corruption and Integrity

The State of Water in Pakistan and the Cost of Failure: This group was led by Dr Roberto Lenton and Mr. Jamal Ansari. Participants primarily focused on the national lack of, and usability of data. They found that the state of water in Pakistan is not due to the shortage of water but rather due to mismanagement. Dr. Lenton added that there is a global aversion to data, however data controls and pricing protect vulnerable segments of society. Participants concluded that it was imperative for Pakistan to focus on collecting and effectively using water-related data to make decisions and effective policies.

Corruption and Integrity: This group was led by Ms. Seema Taher and Ms. Barbara Schreiner. Participants reflected on the importance of media to provide platforms for vulnerable segments of society to voice their concerns. While there is a national water policy, it is both ideologically and practically vague, and is not supported by implementation or legislation. Participants felt it was important to work at the community level as opposed to the national level. Concerns were also raised regarding the level of corruption prevalent in weak institutions, and a need to enhance accountability, participation and integrity in federal, provincial and local governance structures. They concluded that before implementation, strategic planning must be undertaken to ensure that intellectual and financial resources are available to prioritize water.

Group discussion on the State of Water in Pakistan - Cost of failure

Questions and Answers

During open discussions, participants raised important questions about the incentives relating to data collection, as well as ensuring that data is collected independently and autonomously. In Pakistan, data is not effectively compiled, nor has infrastructure been informed by that data. Experts posited that the compilation, storage, integrity and handling of relevant data are all essential to ensure that it can be used as an effective foundation for policy making.

Water Governance & Security – Saving Urban Water from Urban Decay

Session 3A - Panel discussion

Facilitator	**Mr. Zohair Ashir,** Governor & Member Think Tank, Hisaar Foundation
Chair	**Mr. Tasneem Siddiqui,** Chairman, Saiban
Presenters	**Dr. Nausheen H Anwer,** Director, Karachi Urban Lab, IBA
	Mr. Farhan Sami, Country Team Leader, Water and Sanitation Program, World Bank
	Ms. Mahim Maher, Editor, Samaa Digital
	Ms. Daniya Khalid, Manager Research, Hisaar Foundation
	Dr. Noman Ahmed, Dean, Civil Engineering at NED University


Session Audience

The session aimed to explore whether governance reforms can solve issues of urban water,the politics of urban water, introduction of new water technologies and conservation practices to reduce urban decay and a way forward for Karachi's water challenges.

The session was sponsored by Hisaar Foundation

Opening Remarks

Mr. Zohair Ashir began by introducing the chair and the panelists

Panel Discussion

The first speaker, Dr. Nausheen H Anwar addressed the investigation of the relationship between water security, gender and violence in urban Pakistan. She spoke about governance and security and why is it relevant for water? Politics of water supply in Karachi includes challenges of weak governance, compromised institutional capacity, financial woes of KWSB and expanding informal settlements. Water should not only be talked about in terms of shortage and supply but

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Dr. Nausheen Anwer speaking on water security and urbanization

also in terms of security. She presented four angles of thinking of water in terms of security and governance. Firstly global security to national and territorial security, moving to cities where water supply becomes an object of state security and water insecurity embedded in systems of governance. She added that this water insecurity is a gender issue as well. A response to water scarcity and ecological loss requires a new kind of political cooperation.

Mr. Farhan Sami shared that 70% of people living in water stressed areas are from Asia, 700 million people will be displaced because of being water stressed by 2030. He presented examples of world's top water secure cities Rotterdam, Copenhagen and Amsterdam as models to learn from. He also discussed successful models from these cities such as floating water pavilions, groundwater monitoring and continuous water resource mapping. He spoke of the World Bank's programs and interventions focusing on governance capacity. He talked about Pakistan's water and sanitation challenges where the stunting rate in the wealthiest group in urban Sindh, predominantly Karachi, is a high of 24 percent.

Session panelists

Ms. Mahim Maher speaking on the K4 project

Next, Ms. Mahim Meher shared her investigative story on the K4 water supply project and the issues that the project is facing. She highlighted that its design was for the first time being reassessed after 17 years since it started and that's when her interest developed to do a story on it. She showed K4 construction maps and alternate routes and how political interventions have influenced the development of the project and further assessments and delays will increase its operational costs further. She concluded that the question of K4 being developed further remains unanswered.

Dr. Noman Ahmed talked about Karachi's different governing bodies and models including, public private partnership, policy frameworks, public entities, private entities. He said that water governance continues to evolve with the passage of time as KWSB was not there since the beginning and there have been various ways of managing the system, KWSB was formed for managerial efficiency, ensuring water and sewage services available to the people. He further added that water issues faced by Karachi are due to the haywire development of the city and its expansion. There has been a constant battle between the province and the city about who will take control of its municipalities. Karachi is continuing to


Dr. Noman Ahmed talking on the karachi water crisis

grow in size due to increasing migration. It has one of the biggest migrant communities in the country and yet only gets half of the water that it requires.

Ms. Daniya Khalid stated that KWSB needs major transformation and reform because its governance has deteriorated. She gave factual figures on Karachi's water demand and supply. She presented


Ms. Daniya Khalid presenting on the GIPP model for urban water utilities

with a set of governance recommendations for a better system and what may work for KWSB can further be applied to other organizations in Pakistan. She said we have enough global examples for successful urban water management. We should borrow from global best practices, like the example of Manila, Philippines and how a model of privatization may lead to a more sustainable solution with a dynamic leadership on top. She presented the Government Investor Public Partnership (GIPP) model for transformation of KWSB into a dynamic water utility. She highlighted that to make KWSB financially sustainable would require us to enter into new relationships with stakeholders.

Questions and Answers

The panelists were questioned on the future of the K4 project and Mahim Maher answered that in her view it's not going to get built any time soon, she added that the project reflects on the bigger water governance problem. Another question highlighted that the responsibility of water also rests with the citizens, industrialists and other stakeholders and what are they doing about it, do we need social innovations? Dr. Anwar addressed that the large proportions of poor to low to middle income people live with water scarcity on a daily basis. They have actually learned to adopt the behaviour excellently and maybe it's time we learn from them rather than trying to look models and solutions out of literature and all other kinds of innovative schemes.

Conclusion

Mr. Tasneem Siddiqui the session chair, wrapped up the session by highlighting that many master plans later Karachi still doesn't have any approved master plan. The effective, autonomous and powerful local government is important for successful governance of the city where the local government has their own resources to control, only this will directly benefit the citizens of Karachi. Karachi municipal corporation was the most powerful organization at the time of its inception and managed the city in terms of maintenance, and development. Presently we don't have any such structure due to over-centralization. If we see all the main departments like water board, solid waste management, building control all are under the provincial government which is not directly benefiting the citizens of Karachi. KWSB has to be improved and made inclusive which requires participation of the private sector, professionals and technocrats on its board.

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The Indus and Murray-Darling – A Shared Experience of Reform

Session 3B - Panel Discussion

Facilitator	**Mr. Ahmed Rafay Alam,** Water Law Expert
Chair	**Dr. John Dore,** Lead Water Specialist Australia's Department of Foreign Affairs and Trade
Presenters	**HE Dr. Geoffrey Shaw,** Australian High Commissioner to Pakistan
	Ms. Paula Richardson, Australia's Department of Foreign Affairs and Trade
	Dr. Mobin Ahmad, Principal Research Scientist, CSIRO
	Dr. John Macintosh Kirby, Research Affiliate, CSIRO
	Dr. Zaigham Habib, Research Scientist and Hydrologist
	Mr. Mohammed Qazilbash, Country Director, Oxfam Pakistan

Session Audience

The session aimed to examine integrated water practices and shared experiences between Pakistan and Australia on the basis of similar ecological and structural similarities between the two countries.

1) Integrated water management practice exchange between Pakistan and Australia

2) Comparison of Australia's Murray Darling Basin and the Indus Basin (focusing on water management, food production and energy conservation in a changing climate)

3) Identification of Australian sustainability initiatives of relevance for Pakistan's consideration (in the light of similarities and differences in the two basins with changing climate).

The session was sponsored by Australian High Commission (AHC).

Opening Remarks

H.E. Dr. Geoffrey Shaw, Australian High Commissioner to Pakistan, introduced the similarities between the Murray-Darling basin in Australia and the Indus River Basin in Pakistan. He noted that the Murray-Darling basin spans over 5 states, supports 9000 border agricultural businesses, 120 species of water birds and 46 types of native fish. Australia's prosperity in the water sector relies on collaborations across geographies and bureaucratic boundaries. Dr. Shaw posits that these partnerships allow ownership of solutions at both the government and community levels, finding consensus amongst competing environmental, social and political interests. Australia relies on research and evidence-based tools to recycle water, capture rainwater, and fuel desalination projects. He added that Pakistan and Australia both have complex irrigation systems that are grappling with climate change, and it is important for achievements and lessons to be shared between the two countries.

Panel Discussion

The next speaker, Ms. Paula Richardson presented ongoing efforts by the Australian Government to manage water. Like in Pakistan, water is managed at the provincial level in Australia, however, provinces work closely with the federal government. Efforts are made at the basin-scale, to allow for effective planning and allocation, particularly due to drastic differences in year-to-year precipitation levels in Australia. In addition to legislation such as the 2007 National Plan and Water Act, and the 2012

Dr. Mobin Amed, Dr. John Macintosh Kirby and Ms. Paula Richardson

Basin Plan, Australia recently introduced Sustainable Water Resource Plans to ensure consistency in water quality for trading. Richardson provided an overview of the two types of water rights in Australia, allocations and entitlements, as well as the distribution of roles and responsibilities between the Australian Government, Basin-State governments and Basin Communities. She pointed out the need for adaptive management, through trialling innovative techniques and monitoring, to find the best outcomes for largely fluctuating climatic conditions, such as setting sustainable diversion limits through an evidence-based approach.


The session chair Dr. Jon Dore moderating the dicussion

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Following this, a panel discussion moderated by Dr. John Dore commenced with Dr. Zaigham Habib presenting a comparative analysis between the two basins, discussing the physical, ecological and hydrological similarities and differences between the Murray-Darling Basin and the Indus River Basin.

Dr. Mobin Ahmed presented next, outlining the pressures faced by the Indus Basin in Pakistan. He stressed the importance of an evidence-based system to be implemented which would allow Pakistan to objectively and effectively plan for climate change, through interprovincial water sharing. Dr. Mobin discussed a series of ongoing consultations between Australia and Pakistan through the Commonwealth Scientific and Industrial Research Organisation (CSIRO), with a core focus on supporting national and provincial water planning and policy development. The CSIRO aims to undertake and

Dr. Mobin Ahmed discussing the ongoing water sector consultations between the Australian and the Pakistan government

support integrated water resource assessments, data management and capacity building to develop tools that foster agricultural production, food security and livelihood outcomes.

Dr. John Macintosh Kirby added that to date, the CSIRO has conducted food security analysis, gender and socio-economic analysis, surface and ground water quality analysis, and prepared a water apportionment accord tool for seasonal operations.

Mohammad Qazilbash, Country Director for Oxfam Pakistan encouraged the inclusion of women in policy efforts to regulate water, stating that Oxfam Pakistan has trained 50,000 women to become a part of water committees across the Sindh province. He found that these efforts and gender-based models can be replicated in other provinces to ensure more inclusive management and policy decision making systems.

Session panelists for The Indus and Murray Darling A Shared Experience of Reform

Questions and Answers

The session concluded with an interactive discussion between panelists and participants, who questioned the main differences between the two basins and how those differences would impact the way that Pakistan is able to implement learnings from Australia.

Conclusion

Pakistan has an opportunity to learn from Australia and implement similar policies in practice due to the similarities between the Murray-Darling Basin and the Indus River Basin.

Water Infrastructure and Investments – Who Gives a Dam

Session 4A - Panel Discussion

Facilitator	**Dr. Pervaiz Amir,** Executive Director, Pakistan Water Partnership
Chair	**Dr. William Young,** Lead Water Resources Specialist, Global Water Practice, World Bank
Presenters	**Mr. Sardar Mohammad Tariq,** Adviser WAPDA
	Mr. Umer Karim, Water Management Specialist, FAO
	Dr. Hammad Naqi Khan, CEO, WWF
	Ms. Afia Salam, Journalist & Environmentalist
	Mr.Shahid Ahmed, Civil Engineer, WAPDA

The session sought out to explore the place of large and small water infrastructure in the context of WEF nexus. The debate focused on balancing the need for energy and storage with conserving the environment.

The session was sponsored by UBL.

Session audience

Opening Remarks

Dr. Pervaiz Amir introduced the panelists and invited the session chair to initiate the panel discussion.

Dr. Pervaiz Amir opening the session

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Dr. Willian Young speakin on global trends and observations on large dams

Panel Discussion

Dr. William Young spoke on the global trends and observations on large dams. He introduced that at least 3,700 major dams, each with a capacity of more than 1 MW, are either planned or under construction, primarily in countries with emerging economies. The World Commission on Dams proposed by the World Bank in 1995 assessed development effectiveness of large dams and developed best practice guidelines for large dam construction / management, based on review of evidence and stakeholder consultation. Its reports developed "internationally acceptable criteria and standards", and 26 guidelines for future dam projects, with a strong focus on social and environmental justice. The WCD emerges from recent literature as a remarkable institution: bold, creative, and radical; and often credited with exposing the political nature of dam construction. During 20 years since WCD, debate has continued and perhaps intensified rather than abated. Dr. Young added that dam construction has slowed in the decade after WCD but now anticipated to rapidly increase. Partly driven by increasing concerns associated with fossil fuels. He added that the World Bank has moved from "doing dams right" (engineering focus) to "doing the right dams" (planning and impact mitigation focus). But globally, many new dams are not being planned using the WCD approach and thus controversies around negative social and environmental impacts of dams continue. And evidence of these impacts is growing. He highlighted that in the developed world there is a rapid increase in dam removal: due to partly age, partly safety, partly redundancy, partly social and environmental impacts.

He highlighted that dams aren't always an optimal development solution.System-scale planning delivers greater benefits to society. In a rapidly changing world, dams must be adaptable. Governance reforms are often required for dams to effectively balance societal interests. Reducing adverse environmental and social impacts also requires meaningful impact assessments, system-scale analysis of existing dams can optimize benefits, reduce impacts and facilitate responses to climate change, societal needs and economic development imperatives. Removal should be considered where obsolete or inefficient dams are preventing the restoration of ecosystems and/or having negative impacts on communities.

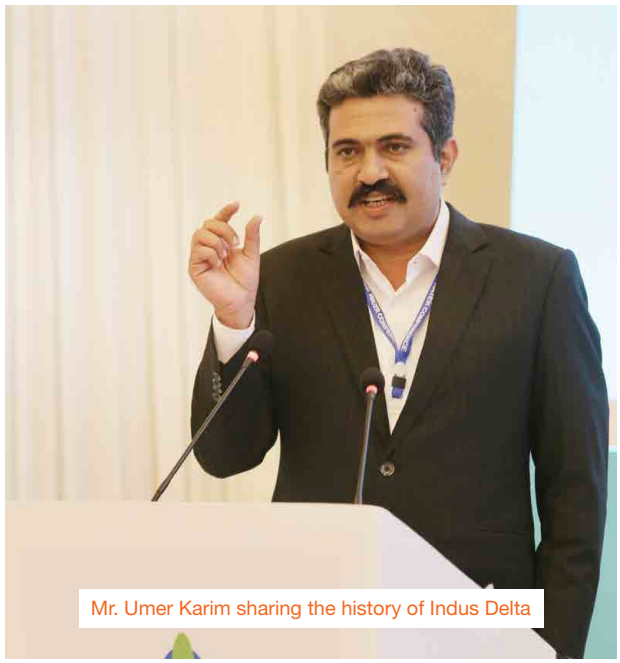
Next, Mr. Sardar Mohammad Tariq elaborated on why we have large water infrastructure. Water is not


Session Panelist, Mr. Sardar Mohammad Tariq

always available ,when you need it and not available where you need it. Pakistan's population and economy are heavily dependent on an annual influx into the Indus River System of about 191 BCM of water mostly derived from snow and glacier melt. He estimated that to meet water demand we must have 40% storage capacity of total water availability. Present storage capacity is only (9.50%) i.e. 17.0 BCM – required (40%) i.e. 71.0 BCM. Surplus water is only available during 30 to 40 days. Over 300 days water availability is less than demand. i.e. we are in a hydrological drought condition every year. Season wise water availability is 89% in Kharif and only 11% in Rabi whereas national requirement is 40% in Kharif and 60% in Rabi. Storage infrastructures are absolutely essential for storing and transferring water from Kharif season to Rabi season.

Additional storage requirement is 51 BCM. Climate change would result in violent hydrological cycles ,severe floods, prolonged droughts and melting of glaciers would result in less water. With astronomical population growth, Pakistan would be in a severe water scarcity situation. After Mangla and Tarbela dam construction, over 3000 industries were established in Pakistan and the number kept on increasing. Development of water infrastructure in the sixties and seventies provided food security and cheap hydropower which gave a boost to the economy and in the seventies and eighties. Pakistan's economy was one of the fastest growing economies of the region.

Next, Mr. Umer Karim brought forward the history of water resource management starting from about 200 years ago by the British, digging canals and conducting surveys leading to construction of Sukkur Barrage where every canal was managed for a specific cropping intensity. He added that in the post independence period, the government focused on water infrastructure construction such as Kotri barrage, Guddu barrage, Mangla dam and Tarbela dam. Post this dams period, we kept on in-



Mr. Umer Karim sharing the history of Indus Delta

tensifying our agriculture unchecked which not only started creating problems for our environment but also for equity, reliability and also put stress on our water energy and food systems. He highlighted the need for accurate data management systems for better water resource management and adoption of the nexus approach.

Dr. Hammad Naqi Khan discussed putting nature to work: integrating green and gray infrastructure. Dams are not the only solution to Pakistan's water problem. Things are changing, people are finding innovative solutions. Post 2010 floods, the Ramsar's assessement report suggested that along with the hardcore engineering sructure we need to find legislations and enabling environment needs to be in place for flood management. A Wetlands Management Authority needs to be established, a shift from hard engineering to soft engineering solutions, documentation of traditional knowledge on flood management to see if those techniques are still employed, restoration of flooded forests and floodplains along the Indus River for flood management, economic valuation of floodplains and introduction

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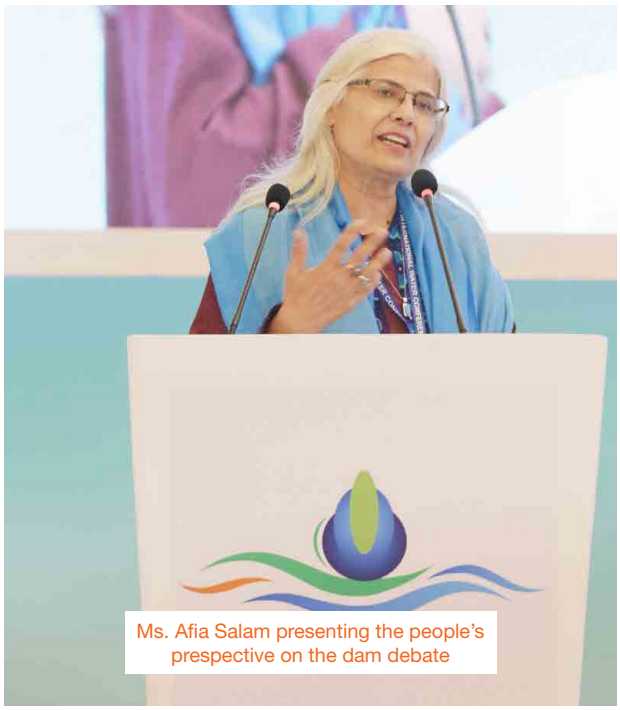
Dr. Hammad Naqi Khan elaborating on green and grey infrastructure

of alternative livelihoods for vulnerable communities and identification of potential sites along the Indus River.

Dr. Naqi introduced a program developed by WWF: Recharge Pakistan for building Pakistan's resilience to climate change through Ecosystem-Based Adaptation for Integrated Flood Risk Management with the aim to alleviate flash flood risks on communities while maintaining environmental flows. By 2030 it will reduce flood risk and water recharge enhanced at 6 sites in the Indus Basin, building resilience of 10 million people and vulnerable ecosystems. It includes the components of ecosystem-based adaptation for integrated flood risk management, enhancing resilience of vulnerable communities to climate change and enabling a paradigm shift towards ecosystem-based adaptation in Pakistan.

Ms. Afia Salam represented the 'people's perspective' on the dam debate. She said we the people are those who are the recipients of the benevolence of those who give us water to drink and who bring us water. Water is a fundamental human right corroborated by the constitution of Pakistan. However, she questioned, do we the people have it? Now the people seek answers about the inequities and injustice of distribution. About the inefficiencies of management, about the disconnect between the givers and takers, about the lack of their input in decision making that has brought us to a point that we are becoming mired in conspiracy theories and suspicions. She added that the people in the fields, in impoverished communities, small towns and villages have an understanding about water that needs to be heard, and then it needs to be


Ms. Afia Salam presenting the people's prespective on the dam debate

heard again, while wearing the gender lens, for in this country, women are the water managers.The people's voices need to become more strident. They need to demand what is their right. They have to ask questions and demand answers much like Shahab Usto did in Sindh! They need to demand governance by consultation, not in isolation of offices. She stressed that citizen involvement like Hisaar Foundation has done, where it has come up with a citizens water policy should be seen as an entry

point of a new kind of engagement where voices from the ground are heard, and accepted as essential drivers of policy.

Mr.Shahid Ahmed presented WAPDAs strategy on large infrastructure, he said that we need water to be stored so that it can be available when there is shortage of water. He discussed the water sector investment plan.The present reservoirs are losing their capacity due to sedimentation,around 27% capacity has been lost.He also discussed the benefits of Tarbela dam and how it is supporting the country's economy. He forecasted that in 2050 the population will be 312 million, the demand for water ,food and energy is increasing . In 2050 additional 60 MAF water is required as well 10MAF for urban requirements, therefore need to manage, conserve and store water for the future.WAPDA has developed plans in phases like the short term – 2025 with 5 MAF / 4,600 MW and for medium term – 2030 with 8 MAF / 16,000 MW and long term – 2050 with 28 MAF / 18,400 MW. WAPDA is committed to develop water storages with innovative financing strategies and institutional robustness, research and capacity building. Capacity building of local consultants with policy, technology and entrepreneur interface.

Mr.Shahid Ahmed presenting WAPDAs strategy on large Dams

Questions and Answers

The panelists were asked whether Pakistan's economic growth is linked directly to water management, if so do you know what percentage? Dr. Pervaiz Amir answered that If you put water into the real perspective, Pakistan's economy is 305 billion US dollars, about 50 billion comes from agriculture and about 50% comes from services, and 20-25% comes from the industry. We have a very strong conviction that we can take 305 billion alone from water and agriculture and wipe out poverty from this country. He recommended that we don't miss out on the opportunity, get rid of mismanagement and elevate your infrastructure. He concluded that we should not give first class water to third class agriculture. Another question raised was what is being done about spreading this awareness of waterborne diseases to the people? Dr. Naqi answered that water borne diseases are linked with water pollution,mismanagement. He added that half of the hospital admissions are due to waterborne disease,infant mortality rate is one of the highest in the region due to poor water quality.

Conclusion

Dr. William Young in his concluding remarks recommended that if Pakistan improves how to manage water without wastage we will be able to provide water to the whole country and can generate enough food to feed the growing population as well as train the farmers, highlighting that it's a big opportunity to manage the resources of Pakistan.

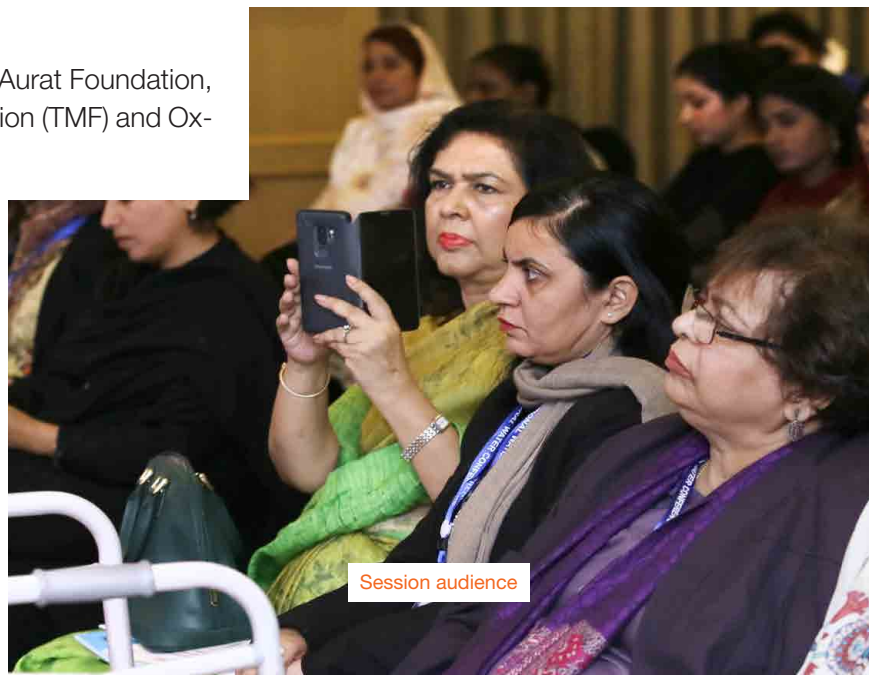
Does the Nexus Actually Work? Women's Perspective

Session 4B - Panel discussion

Facilitator	**Ms. Meher Noshirwani,** Governor, Hisaar Foundation
Chair	**Dr. Abida Farooqi,** Assistant Professor Environmental Sciences, Quaid e Azam University
Presenters	**Ms. Mumtaz Mughal,** Director Programmes Aurat Foundation
	Ms. Farzana Saleem and Ms. Farkhunda Aurangzeb, Members, Women and Water Network
	Ms. Mehnaz Nadeem, President, Old Associates of Kinnaird Society
	Ms. Samina Bheel, Social activist (Thaparkar)

The session sought to ascertain if the WEF nexus is something that resonates with women; whether this concept is useful and usable for Women and Water Networks.

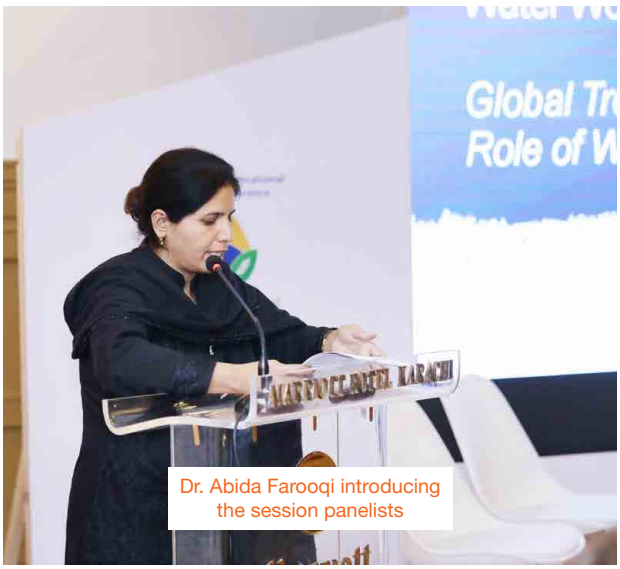
The session was sponsored by Aurat Foundation, Thardeep Microfinance Foundation (TMF) and Oxfam Pakistan.



Session audience

Opening Remarks

The session chaired by Dr. Abida Farooqi commenced with opening remarks on the important role of women in water governance, and the need to include women in the WEF nexus.



Dr. Abida Farooqi introducing the session panelists

Panel Discussion

Ms. Meher Noshirwani highlighted that globally, gender inequalities in access to water are large, and 70% of households without access to drinking water on their premises task the responsibility of water collection to women and girls. She noted that urban and rural women are both challenged with water scarcity, and despite the roles given to women in water collection, voices are often ignored in decision making processes. She stressed the need to have more women working in all levels of the water sector to ensure that their voices are channelled into mainstream policies relating to water, food and livelihood security.


Ms. Meher Noshirwani speaking on Women and the WEF Nexus

Ms. Mumtaz Mughal presented a summary of the Women's Colloquiums held in collaboration with the Aurat Foundation. For example, during the 2010 floods in Pakistan, campaigns were launched through radio programs for women's empowerment in the water sector. In 2017, the Women and Water Networks were established which focus on water as a women's rights issue that directly affects women's lives. The WWN includes women's rights activists, young students, academics, researchers, representatives from NGOs, political party


WWN representative sharing her field experiences

representatives as well as members of provincial assemblies. She discussed the need to strengthen information and knowledge systems regarding water challenges and solutions, and to develop a roadmap for further strengthening the capacity of WWN's for advocacy and lobbying. The need to collect sex and gender-disaggregated data was also advocated, in order to strengthening women's participation in the WEF Nexus.

Conference Proceedings

Ms. Farkhunda Aurangzeb highlighting the role of WWN

Ms. Farzana Saleem and Ms. Farkhunda Aurangzeb added that the WWN's were created and expanded to villages and union councils, to ensure that women at the grassroot level of communities were included. They noted that when women are brought together, they have a stronger collective voice to challenge the male-dominated water sector in Pakistan.


Session audience

Ms. Mehnaz Karamat of Old Associates of Kinnaird Society presented the water projects in Thar. She discussed the work done by OAKS and Hisaar Foundation to rehabilitate over 300 old wells, and installing 80 new ones. As part of the program, donors and partners 'adopt villages' and partake in the 'gift a goat' program with elderly community women to assist in their livelihoods. The team has also started working on building toilets in the villages due to concerns regarding sanitation.


Session audience

Ms. Samina Bheel added that the work done by Hisaar Foundation in Thar is commendable, and the projects pertaining to installation of solar panels, wells and filtration have facilitated women in the region immensely.

Conclusion

There was a consensus regarding the need and importance of the inclusion of women in the WEF Nexus.

Fireside Chat on Valuing Water

Session 5 - Fireside chat

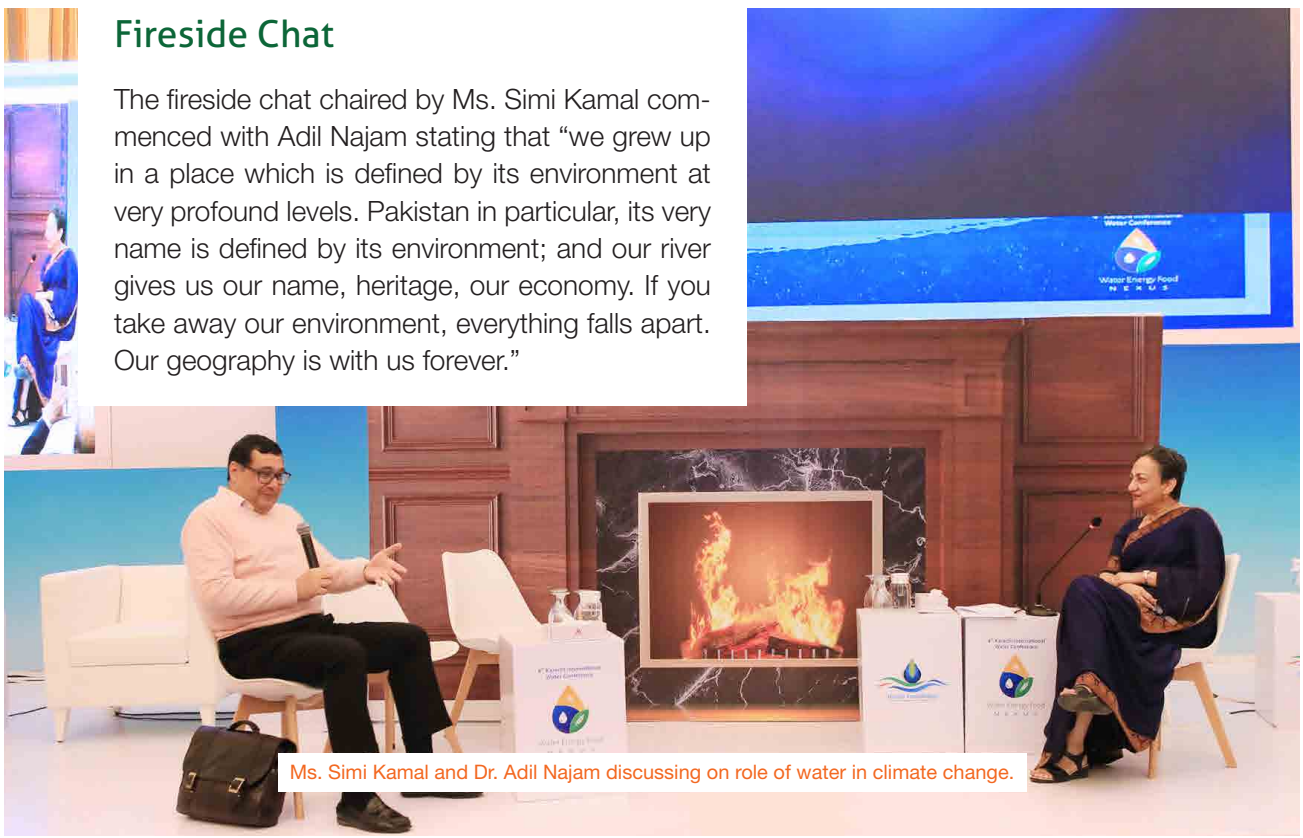
Facilitator	**Mr. Wasif Rashid,** Communication Consultant
Chair	**Ms. Simi Kamal,** Founder and Chair Academic Committee, Hisaar Foundation
Presenters	**Dr. Adil Najam,** Dean, Frederick S. Pardee School of Global Studies, Professor of International Relations and Earth & Environment, Boston University.
	Ms. Nadia Naqi, Television Anchor, News One
	Ms. Ayesha Khan, Country Director, Hashoo Foundation

The session was designed for free flowing conversation on water security.

The session was sponsored by Hisaar Foundation.

Fireside Chat

The fireside chat chaired by Ms. Simi Kamal commenced with Adil Najam stating that "we grew up in a place which is defined by its environment at very profound levels. Pakistan in particular, its very name is defined by its environment; and our river gives us our name, heritage, our economy. If you take away our environment, everything falls apart. Our geography is with us forever."



Ms. Simi Kamal and Dr. Adil Najam discussing on role of water in climate change.

Conference Proceedings

Dr. Adil Najam highlighting the significance of WEF Nexus approach

Ms. Nadia Naqi speaking on role of media in climate change discussions

As Dean of Pardee School of Global Studies at Boston University, Dr. Adil Najam talked about his interdisciplinary approach to academia. “We define the world in boxes. Organising the world in narrower and narrower disciplines has reached its limit. It is important for us to now integrate those disciplines. The real challenge is in bringing different subjects together, to break the silos of knowledge that we have created.” When asked about the move away from sustainability to stewardship, he noted that he prefers the term ‘sustainable’ to ‘sustainability’, as the former allows for nuance in growth. Like in academia, our way of approaching climate change needs to be through an integrative model, which is what the WEF Nexus presents. He added that “we are living in an age where our problems demand integration; food is nothing but nature’s way of packaging water.”

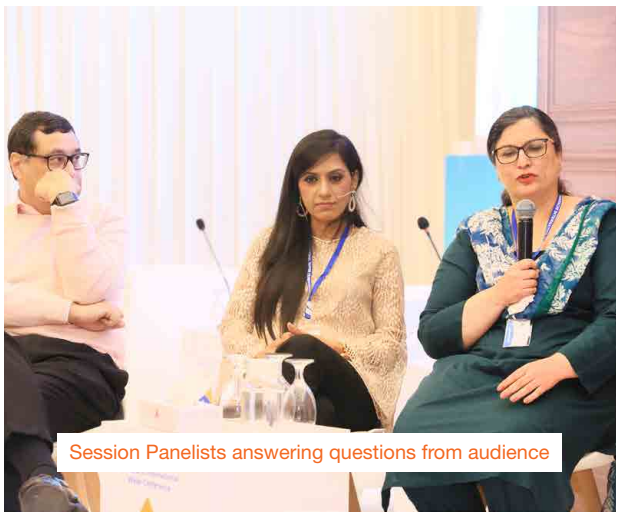
Next Ms. Simi Kamal invited Ms. Nadia Naqi, a television anchor on News One and Ms. Ayesha Khan, Country Director of Hashoo Foundation to join the panel.

Nadia Naqi reminisced about her childhood and the early stages of her career. Her interest in water developed during field work in Karachi, where she observed women and young children collecting water for daily use. She noted the importance of media in discussing social issues and creating meaningful discourses. There is some progress in this area, and she has made efforts to include segments about water and climate change in her show. She noted that we live in an era of headlines and spoke about the challenges of bringing such critical issues to the screen amidst all the entertainment and politically charged shows. She added that the audience has to take ownership and demand such informative and awareness raising shows as well.

Ms. Ayesha Khan speaking on CSR and investing in climate change initiatives

Ms. Ayesha Khan discussed the need to invest in corporate social responsibility towards climate change initiatives. Ms. Kamal asked her if the cor-

porate sector of Pakistan is sufficiently aware of water problems, and what these challenges may mean for that sector. Ms. Ayesha Khan responded saying that water shortage will have a significant impact on businesses from an economic valuation perspective, but there is much more awareness needed. She feels that the public has become apathetic, and citizens must raise demands and pay attention to regulation and services in order for the private sector to create the supply to meet those demands.



Session Panelists answering questions from audience

Question and Answer

Ms. Simi Kamal asked the panel about using public-private partnerships to promote narratives surrounding WEF nexus. Adil Najam responded that the private sector is incentivized and driven by profit, and it is important for profit motives to be used for public purposes. The public consumer therefore needs to assert pressure on corporations. He noted that empty sloganeering is common in the private sector as well as the government. Unless there is mobilized demand from the public, whether citizens or consumers, it will be difficult for other sectors to take measures in the right direction. The panel was also asked about the intellectual gap between academia and experts, and those who have the ear of the public, as those who are heard are not those who are at the centre of these conversations. Ms. Nadia Naqi responded noting that it is important for the government and media to have a relationship with the formal education system. Adil Najam added that "this gap is being bridged by the youth and by data. All over the world, there is a global movement of young people taking to the streets, saying that they have not been given the world they were promised." Public demand, based on informed activism, can be an effective tool for change.

Session Audience

Conference Proceedings

Water Governance & Security – Food Production and Agriculture Development

Session 6A - Panel discussion

Facilitator	**Ms. Daniya Khalid,** Manager Research, Hisaar Foundation
Chair	**Ms. Robina Wahaj,** Senior Land and Water Officer, FAO
Presenters	**Dr. Mahmood Ahmad,** Advisory Council Member, BIPP
	Mr. Banaras Khan, Resilience Program Officer, FAO
	Mr. Jippe Hoogeven, Senior Land and Water Officer, FAO Headquarter Rome
	Dr. Abdul Majeed, Country Manager ICARDA
	Ms. Zaigham Habib, Consultant Hydrologist and Water Resources

The session explored the importance of WEF nexus in the context of water and food security and to bring forward global and regional good practices in the context of agriculture and food production. Food security in Pakistan and efforts of FAO were highlighted as well.

The session was sponsored by FAO.

Session audience

Ms. Robina Wahaj opens the session as chair

Opening remarks

The chair Ms. Robina Wahaj introduced the session aims of having a discourse on water food and energy nexus in the context of climate change and how climate-smart agriculture and green growth can help in these issues.

Panel Discussion

Mr. Jippe Hoogeven presented FAOs approach to the WEF nexus and interconnectedness of water and agriculture, energy and agriculture. Water use in agriculture is the main user of water, 70% of our water goes to agriculture. Most water that is used for industries goes back to the system but not the one used for agriculture. The energy used in irrigation for the food production and supply chain uses an estimated 30% of total energy consumption, irrigation pumps, land preparation, fishing boats, and fertilizers to use a lot of energy to be produced. We need to make sure to use energy in a smart way like direct and indirect interventions at farm levels. At FAO, the nexus approach proposes that everything is interconnected to each other. We need to balance it differently but also take into consideration the integration of ecosystems. FAO has a resource-based approach. The goals include how much energy water food we need to produce. The drivers included in the model are climate change, population growth, etc. He highlighted that everything is interconnected. FAO proposes a stakeholder dialogue on the interconnectedness of the issues where we must be able to have tradeoffs and we must balance resource use.

Mr. Jippe Hoogeven presenting FAOs approach to the WEF nexus

Mr. Banaras Khan discussing the Climate-Smart Agriculture approach

Mr. Banaras Khan discussed the Climate-Smart Agriculture (CSA), he shared the experiences of FAO in Pakistan on tackling agricultural approaches. He explained that climate-smart agriculture enables farmers to use new technologies and techniques to maximize yields and allow land managers to protect natural systems, with natural habitats integrated into

agriculturally productive landscapes, and the adaptation of efficient technology in agriculture. FAO is supporting the government in revising the provincial agro-ecological zones at Punjab and Sindh, establishing a baseline "climate-smart agriculture profiles" by focusing at 3 tiers (provincial, district, villages). FAO has implemented the climate-smart villages plans approach in selected villages. Examples of CSA include System of Rice Intensification (SRI) including introduction and promotion of Flood & Drought Tolerant Rice, Direct Seeded Rice (DSR), Alternate Wet & Dry Method (AWD), Line Sowing and Raised Bed Cultivation of Rice.)

The next panelist Dr. Mahmood Ahmed presented evidence-based research on unsustainable vs sustainable production practices. A production system is unsustainable if farming practice imposes negative environmental externalities such as downstream pollution of water through chemical residues, creates environment degradation (such as desalination of water aquifers) or results in both types of market values. He added that our productivity growth lacks compared to input growth, our fertilizer growth was higher than the yield. We need to move from conventional versus paradoxical agriculture means that it is inclusive, sustainable and green. He concluded with policy recommendations of significant improvement in comparative advantage, reduced input costs, improving competitiveness and sustainable farm practices.

Dr. Mahmood Ahmed presenting on sustainable food production practices


Dr. Abdul Majeed speaking on technology for small farmers

Dr. Abdul Majeed shared his experience and challenges of bringing technological interventions to small farmers. He shared his program where a select 70 people from 4 provinces of Pakistan were trained on adoption of agriculture technology. They were trained with 15 different technologies on water, agriculture and energy. Furthermore they are planning to give them business ideas and linking them with the private sector, public sector and contractors. This model was successfully implemented at Balochistan where the farmers were connected with private sectors and they were earning well.

Dr. Zaigham Habib discussed whether WEF nexus has practical applications or is merely a theoretical concept. She shared that this two day conference

Dr. Mahmood Ahmed presenting on sustainable food production practices

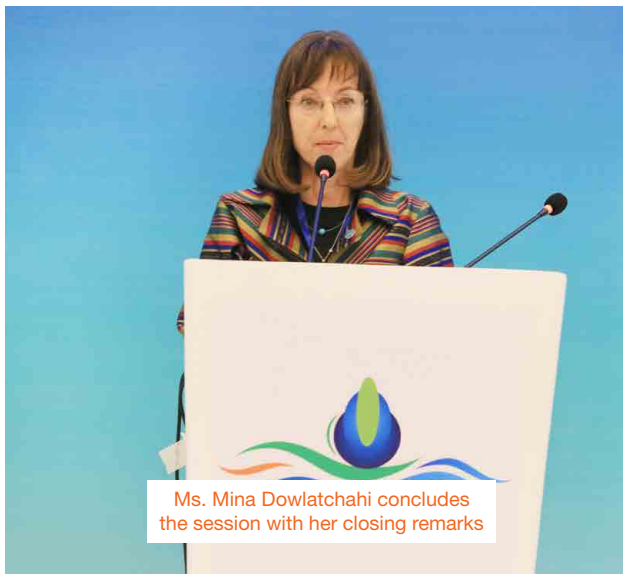
has brought forward practical examples. Governance and security are important for this nexus and there should be more dialogue linked to sustainable systems for water ,energy and agriculture.

Questions and Answers:

The panelists were asked if there are any statistics available on the economic impact of heat waves experienced in the last two years? Mr. Banaras Khan informed that no such statistics are available yet. He added that the heatwave has impacted the urban areas (such as Karachi) for the last 2 years, unfortunately, the robust statistics and study are not available. Another participant inquired if there are any examples of a great solution in terms of saving the environment (water, agriculture, food wastages) that can be applied to Pakistan.There panelists informed that there is a strong relation between water and agriculture. The policy emphasis is on getting more water. The emphasis should be focused on improving the productive efficiency. Some of the tradeoffs are not very clear. How can we be allocated between different sectors? The same goes for energy, not much has been done. We are investing so much in production but so much can be done on adopting policy on demand management both in water and energy. Another question asked was can we influence farmers to move to sustainable practices? Dr. Abdul Majeed answered that many solutions are available and smart agriculture is a way. There is no new system available to the farmer and they totally rely on other people. Until those people are educated and trained, only then our traditional agriculture will be converted to modern agriculture.

Conclusion

Ms. Mina Dowlatchahi summarized that sustainability refers to socio economic and therefore it's not just the income but how all economic systems work together and also in agriculture the role of women is important,especially in rural areas. There has been a lot of research and technology advancement in Pakistan in the last 10 years and looks like solutions are there. Pakistan has been extremely successful in bringing in knowledge from outside and also developing its own experience so the solutions are there. Food and agriculture systems need to be looked through the nexus lenses to make sure all the trade offs are considered and the people are at the centre.



Ms. Mina Dowlatchahi concludes the session with her closing remarks

Conference Proceedings

Nexus Approaches for Water Policy and Strategy

Session 6B - Panel Discussion

Facilitator	**Ms. Meher Noshirwani,** Governor Hisaar Foundation
Chair	**Mr. Khalid Mohtadullah,** Ex member WAPDA & Member Think Tank, Hisaar Foundation
Presenters	**Dr. Mohsin Hafeez,** Country Representative, IWMI
	Dr. Pervaiz Amir, Director, Pakistan Water Partnership
	Mr. Ehsan Laghari, Senior Drainage Engineer
	Ms. Sanaa Baxamoosa, General Manager, Hisaar Foundation
	Dr. Ahmed Kamal, Chairman, Federal Flood Commission
	Dr. Hassan Abbas, Researcher on Hydrology and Water Management
	Mr. Khurshid Akram, Program Manager, Oxfam Pakistan
	Dr. Sono Khangharani, CEO, Thardeep Microfinance Foundation

The session aimed to assess whether the WEF nexus is reflected in global water policy discourse; Pakistan water policy discourse; and provincial water policy discourse.

The session was sponsored by International Water Management Institute (IWMI).

Panel Discussion

Dr. Mohsin Hafeez presented the links between global, regional and national level strategies pertaining to water and the WEF nexus. He identified IWMI's strategic response to global water challenges to be through three main areas; food, climate and growth. Their key pillar of work is through the WEF nexus

Session audience

to improve water productivity, blending innovative technologies (including telemetry systems), linking research outcomes to water policy and engaging in holistic water resource management.

Dr. Ahmed Kamal discussing on data needs for water policy

The work done by IWMI in Pakistan was commended by Dr. Ahmed Kamal, Chairman Federal Flood Commission, who added that they have provided authentic data for water distribution in 10 different stations in the country. Dr. Kamal remarked that the government has initiated numerous projects in the water sector over the last two decades, however it has been challenging for those programs to be completed within given time frames. It is therefore important to bridge gaps between provincial and local institutions, and to provide the necessary resources for projects to be completed efficiently and effectively.

Ms. Sanaa Baxamoosa presented the Hisaar Foundation's Think Tank on Rational Use of Water's Recommendations for Pakistan's National Water Policy Framework, which stakeholders have called the 'citizen's water policy'. The framework is based on the themes of integration, innovation and inclusion to focus on five focus areas with ten goals of implementation: improving access to water for the poor; financing urban and rural water economies; safeguarding the Indus Basin; improving governance structures and management; and building a base

Ms. Sanaa Baxamoosa presenting on Hisaar Foundations recommendations for Nation Water Policy Framework

for science and technology. The framework also outlines responsibilities for action at the federal, provincial, city and local levels.

Dr. Pervaiz Amir commented on the weaknesses of the Punjab Water Policy, specifying the lack of consultations with citizens and experts undertaken prior to its drafting. He noted that the policy is vague, long and consequently difficult to implement and not feasible. Mr. Ehsan Laghari agreed, and added that the Sindh Water Policy too, must be inclusive, pragmatic and action-oriented. Given that Sindh has four differing ecological environments, it

Dr. Pervaiz Amir disussing Punjab Water Policy

is important to form a steering committee that has representation from experts, civil society and academia that are able to inform an evidence-based policy for implementation.

Conference Proceedings

Dr. Hassan Abbas comparing approches towards water policy formulation

The second panel discussion in this session began with Dr. Hassan Abbas discussing the differences between Pakistan's approach to water policy and those of developed countries. He shared that the most effective approach to water management systems is through a bottom-up approach and public-private partnerships. Giving examples of the successful water systems in Israel, he added that Pakistan needs to change its current approach, learn from previous mistakes and manage competing interests through partnerships, in order to create and implement beneficial water policies.


Mr. Khurshid Akram discussing his research on water distribution

Mr. Khurshid Akram of OXFAM shared his research which showed unequal water distribution, as well as water theft, and lack of effective water governance in Pakistan. The study found that power has not been delegated to the local level and decisions are largely being made by the apex government organization i.e. the Sindh Irrigation Department and SIDA structures are still weak. There have been little to no remedies undertaken at the state level to address these water-related concerns.


Dr. Sono Khangharani highliting the gaps in water policy for adressing rural areas

Dr. Sono Khangharani shed light on the lack of data, which has amplified concerns regarding water management, and community resilience to climate changes in areas such as Tharparkar is reducing.


Dr. Mohsin Hafeez presenting on WEF strategies

Conclusion

The panelists were of the view that there are still many gaps between the global approach to WEF nexus and the national and provincial policy discourses in Pakistan.

Water Infrastructure and Investment – A Bespoke Model for Water Financing

Session 7A - Keynote speech, Panel discussion

Facilitator	**Mr. Zohair Ashir,** Governor and Member Think Tank, Hisaar Foundation
Chair	**Mr. Arif Usmani,** President and CEO of National Bank of Pakistan
Presenters	**Mr. Rikard Liden,** Lead Energy Specialist, World Bank
	Ms. Barbara Schreiner, Executive Director, Water Integrity Network
	Mr. Ali Ansari, CEO X-Petroleum
	Mr. Adnan Asdar, CEO, Multinet,
	Mr. Samar Husnain, Executive Director, Development Finance State Bank
	Mr. Javed Syed, CEO, Invency Private Limited

Mr. Zohair Ashir introducing the session proceedings

The session was sponsored by UBL

The session aimed to identify water financing instruments and financing models for the 21st century Pakistan

Opening remarks:

After a brief introduction of the panelists, Mr. Ashir pointed to the Hisaar Foundation's Think Tank's study of water economy of Pakistan. He referred to 'The Great Betrayal', a presentation by Dr. Salman Shah, Think Tank member and now Advisor to the Punjab Government makes a 'compelling case'. Mr. Ashir then went through the water metrics of Pakistan's agriculture and how to tap the potential of Hisaar's Water Financing Vision.

Panel Discussion:

Mr. Rikard Liden opened the discussion by explaining staged financing of mega-hydro projects, usually considered a high-risk option with a long gestation period: bring in money when you need it – commonly referred to as sequence financing. Diamer Basha and Dasu fall into this blended

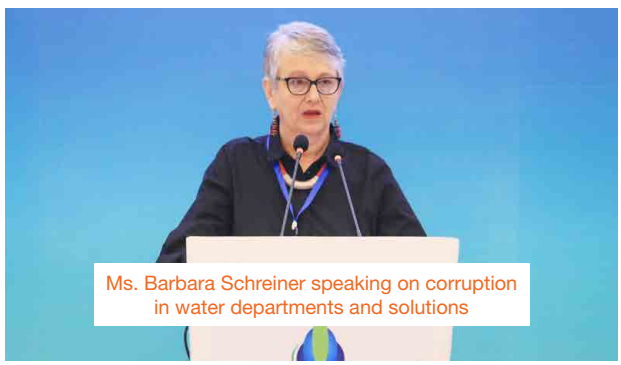

Mr. Rikard Liden discussing the World Banks Financing strategy for mega hydro projects

financing category, with $600m already raised for preparatory work, with 7 to 8-year period left to raise finance and construct the dams through IDA guarantee then raising finance through sovereign debt. The World Bank is raising WAPDA's skill level to undertake financing of projects, a first for the organization.

Mr. Adnan Asdar speaking on water delivery opportunities

Mr. Adnan Asdar brought the consumer and access into the equation: water is available, it boils down to a distribution issue, and therefore an opportunity for entrepreneurs. All we need is concessions as Banks can support us as experts. The government should be considering piloting projects. Mr. Asdar spoke on implementing bespoke projects – looking at the last mile of delivery, and making it billable.

Ms. Barbara Schreiner's talk focused on holding individuals and organizations responsible for failures in implementation: who bears the cost, she asked,



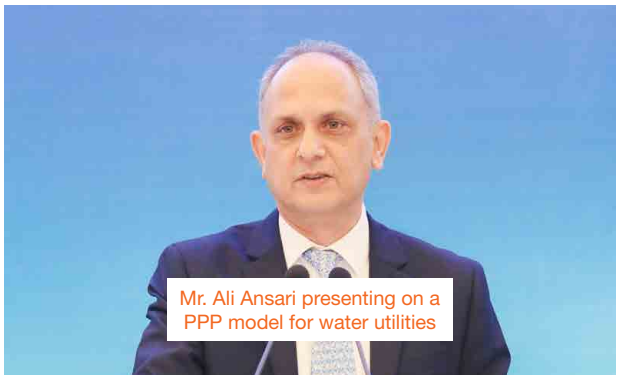
Ms. Barbara Schreiner speaking on corruption in water departments and solutions

of corruption, deliberate distortion of figures and poor delivery? She suggested legislation be built in- an integrity wall holding people accountable, participation in planning and decision making. Diversity in management structure with more women in the decision process may be the way forward said Ms. Schriener, as well as cross platform/open procurement, similar to the Ukrainian model – the open procurement processes of Prozorro and DoZorro.

Mr. Javed Syed speaking on investing in water delivery solutions

Water must not be looked at in isolation; it's about conservation, pricing and delivery of a consumable product. Mr. Javed Syed covered the issues and holistic solutions to overcome these obstacles. Working to clean sea water rather than just standing flood water should also be considered. It was a question of cost, Mr. Javaid continued, and greater private sector involvement was the key. Many experts at the conference had stressed the need for greater private investment in the water sector

Increased investment in the water infrastructure was the benchmark of Mr. Ansari's presentation. There must be greater interaction with the private sector; better storage, generation, treatment/recycling and a robust pricing system put in place-investments from catchment to end-consumer. At present only 36% of the population has access to drinking water, which is an unacceptable state of affairs.



Mr. Ali Ansari presenting on a PPP model for water utilities

The downside is corruption and gross incompetence. Storage capacity is limited, thanks to a system which has remained stagnant for the last 50 years. Mr. Ansari was convinced that the PPP model to build infrastructure projects was the way forward; backed by sovereign guarantees, the model could address Pakistan's water dilemmas.

Mr. Samar Husnain presenting on Green Banking

Mr. Samar Husnain spoke on the linkages between the agriculture and the SME sectors to create an enabling environment, develop markets, and build capacities of lending organizations. The State Bank is working on developing 'Green Banking', water conservation projects, and better loan concessions. The State Bank is looking to encourage collective action-moving forward together, not work in isolation.

Mr. Arif Usmani concuding the session with his remarks on reforming financial structures and water pricing

Mr. Usmani spoke of the complex financing structures associated with pricing water– who will pay and transparency. NBP has created separate business groups to deal with the transparency issue and the State Bank is actively involved -a major plus - as is the greater involvement of academia and agriculturalists at the front-end of struggle. He ended by saying it was time to put the 'National' back into NBP and bring greater diversity to the decision-making process. Pakistan may become water-stressed by 2030 - an unimaginable scenario in his view.

Questions and Answers

The panel was asked should the State Bank form a water division? Mr. Hasnain replied that this was not the remit of a central bank but dedicated institutions.

Conclusion

Mr. Ashir concluded the session by highlighting the need for greater involvement of private institutions and banks in the water sector. It was encouraging to note that the State Bank and the National Bank of Pakistan were taking a hard and long-term look at Pakistan's water issue. Developing solutions was now paramount, as time was short and the clock ticking.

Conference Proceedings

Leaving No One Behind – Young People Calling for Climate Emergency

Session 7B - Interaction with audience

Facilitator	**Mr. Tofiq Pasha Mooraj,** Governor, Hisaar Foundation
Chair	**Mr. Fawad Soomro,** Head, Engro Foundation
Presenters	**Ms. Granaz Baloch,** CEO UDaan
	Ms. Shehla Batool, Ph.D Scholar, Quaid-e-Azam University
	Mr. Mohammad Arfan, Ph.D Student, US-PAKISTAN Center for Advanced studies in Water
	Ms. Leila Alam, Climate Activist, Eco-Batcha
	Mr. Danish Khan, Management Consultant
	Ms. Daanika Kamal, CEO, The Colour Blue
	Ms. Rija, Organizer, Climate Action Network
	Mr. Azeem Shah, Senior Regional Researcher, IWMI
	Ms. Farwa Hussain, Marketing and communication coordinator, Traydstream Limited

This session aimed at understanding the perspectives of the youth on the WEF Nexus and engaging on the climate emergency.

The session was sponsored by CapNet.

Opening Remarks

Mr. Tofiq Pasha Mooraj introduced himself and shared about a recent conference in Jakarta, Indonesia, that he attended on water conservation especially with reference to religion. At the conference, they visited a mosque where they had employed rainwater harvesting and recycling

Session audience


Mr. Tofiq Pasha Mooraj introducing the session proceedings

water for horticulture, food crops and recharging aquifers. He shared with them that in Pakistan we also have mosques where we should be able to re-use water. He presented a video made ten years ago on water issues in Karachi and reflected that since the video was made, not much has changed.


Ms. Farwa Hussain presenting on Youth Jamboree

Panel Discussion

Ms. Farwa Hussain, introduced how she joined Hisaar Foundation through their Water Conference in 2017 where she was the youngest speaker to present a group project on water mapping of water supply system in Karachi. The main partners of the last conference, Hungarian Government, invited her to attend a three-month long training on Urban Water Management in their country. She recapped the conference pre-event of the Youth Jamboree, which aimed to create awareness about the complex relation between the water, food, energy and the gap that exists in the system. While working with Hisaar she realized that not a lot of youth participation is seen in this sector. Therefore, through this pre-conference session, she hoped to provide an opportunity to the youth to engage with the international conversations around these issues. Farwa Hussain shared that Ms. Asra Rizwan, founder of Open Mic, collaborated with them and had open discussions with youth to encourage activism in them. Similarly, Mr. Safi ul Haq from VCast talked about asking the right questions and creating avenues for dialogues within our own communities. Photos were played at the same time to show the engagement of youth during the activity.

Ms. Hussain shared the example of the youngest socio-eco entrepreneur in Pakistan, Ms. Iman from the Youth Jamboree. Iman introduced her doll, Fiza, which was handmade from organic cotton. The doll was the alternate of Barbie because it was not made


Ms. Iman introducing her intiative of plastic free dolls

from plastic and comes with a book. Ms. Hussain concluded that we have to become the torch bearers and take control from the older generations to take the cause of food security, equitable energy supply and access to clean water supply and everything that is in our hands and move forward from there.

Conference Proceedings

Ms. Daanika Kamal speaking on climate change and human rights

The next panelist, Ms. Daanika shared her view that she sees climate change as a human rights issue. She published a book based on this perspective. She added that we have imposed climate change issues on ourselves because of our mistakes. The ones who will get most affected by it are those who cannot do anything about it i.e. the future generations and the ones living at the poverty level. The right to have better natural resources and the right to inherit the same heritage and culture are the areas that the next generations have been deprived of due to climate change. Through a platform like this conference we can get ownership of it.

Mr. Danish Khan shared his experience from Australia, where the indigenous communities were getting water from watering holes. They used to line the holes and water was seasonal so they managed it to balance its use. Similarly in Pakistan the Karaez system was in place. Both in Pakistan and Australia these systems were based on water equity which has been used for years to sustain civilizations. A certain amount is kept for people who need the water most e.g. underprivileged and farmers.


Mr. Danish Khan speaking on significance of indigenous ways of water delivery


Mr. Azeem Ali Shah presented on data needs for water and climate change

The next panelist, Mr. Azeem Ali Shah reflected that the water crisis in Capetown last year was a huge issue, therefore, the concern and importance of the issue is now understood by South Africa. He claimed that the technology to conserve water, such as sensory devices that release water that soil needs for the crop, has been there since the last 10 to 15 years. He shared that in South Africa he had seen that the fields required water and water was flowing in the river to the dam built for Mozambique, one of the poorest regions. They were not using the water because it was needed for the dam from where it was going to be supplied to people who needed it most. He further claimed that now water can be accounted for through remote sensing, its volume can be measured through portable devices, and solar irrigation and desalination can further reduce the cost of water. He suggested that

data is considered an issue but it can be addressed through technology. He finally concluded by stating that water quality and its monitoring is an issue that can be resolved through affordable probes available to check the quality of water as it flows from mountain to the sea.

Ms. Rija represented the climate action network and explained how the network organized the climate march in September all over Pakistan. Ms. Rija shared the history of the Climate March initiated by Global activist Greta Thunberg. In September the march was organized in 33 cities in Pakistan and in Karachi alone around 2000 people participated. They demanded a climate action emergency, including the ban on usage of coal, more sustainable lifestyle and awareness and better usage of water from the government. She reflected that there has been a war for oil but now the war will be for water because it is our basic necessity. It is a matter of concern because we need everyone to stand up and get involved. Other than creating awareness, one aim of the march was to form a pressure group for the government and to demand climate smart decisions.

Panelists from Habib University, Mr. Ali and Ms. Narjis presented their project 'Shape of Water' which used the framework of political ecology to see how environmental and politics needs to be merged together. They presented the stages where the water gets lost in Karachi as there is disparity in different locations of water. They shared that the water gets lost in water theft, water leakage and then because of that there are illegal water groups. They developed preliminary and cognitive maps of three areas: Lyari, Defence and Gulshan, and found out that it is a layered issue because intangible factors such as ethnicity, socio-economic background and gender were creating tangible results. The finding showed that Gulshan is upstream that is why it is getting water and Defence has desalination set up. Metering is sometimes presented as a solution but it is only effective if you have an accurate map of how the water infrastructure system is working at a very grassroots level. They concluded that in Karachi whether you are getting water or not, you are either the cause or the effect of the problem. Hence, with so many stakeholders, there is a need to resolve water issues in the city.

Mr. Ali and Ms. Narjis presenting their project 'Shape of Water'

Ms. Anusha Fatima introduced her Karachi based startup TrashIt that helps people make better choices every single day. Anusha shared that they collect segregated waste, take it to their urban facility, make compost and also send recyclables to right recyclers. The compost is available for people to grow their own vegetables. By the end of this year they are going to divert 100,000 kg of organic waste from landfill to make compost. They also have an ecostore from where people can get small everyday life switches to say no to plastic. That is the least people can do in this time of emergency. They also organize workshops for people to learn about composting and creating their own vegetable gardens to empower people to develop urban vegetable gardens.

Ms. Leila Alam shed light on the climate emergency and her actions and responsibilities as the youth of today. She shared that along with her father, Advocate Rafay Alam, they filed a petition against Punjab Environmental Protection Council because they

Conference Proceedings

Ms. Leila Alam speaking on climate emergency

started using wrong classification for air quality. She added that the law is there, we should try to approach it to find solutions.


Ms. Shehla Batool sharing her experience of taineeship with Budapest Waterworks

Ms. Shehla Batool shared her experience of Hungarian traineeship as well. Currently she is doing her PhD from Quaid-e-Azam University in Water Management and Policy. She has a start-up called Water Stewards and shared her achievements.

Ms. Granaz Baloch sharing challenges of women and youth in rural areas

Ms. Granaz Baloch shared her background. She belongs to a remote city of Turbat, Balochistan and was doing her MPhil in desalination of seawater but her focus is to take low cost date tree trunk as absorbent. So far she has organized two climate marches in Turbat and Gawadar. In Turbat they are living in extreme hot weather without electricity and cold water. She shared the challenges faced by her community in the area.

Ms. Neelofar Jameel shared she was from Quetta where she teaches at Lal Bahadur Khan University and is a proud social and environmental activist and volunteer. She has started a club in her university with 700 female volunteers from all over Balochistan. They have established one grape and one aloevera garden on commercial basis. They are also making compost from the organic waste. In Balochistan, students do not get as much exposure as students in other cities but they have potential and energy and just need the right direction. She shared that when students take admission in environmental science subjects then the families question the scope of the field because they think that only teaching work is left for them to do. She is trying to change the mindset.

Mr. Muhammad Arfan presented his study on water governance

Mr. Muhammad Arfan from Mehran University shared his work on water governance. People are usually critical of the traditional knowledge systems but he criticized the new practices as well coming from international discourse and debates on ecology, politics, infrastructure and development. He recommended that participatory reforms are one of the best ways to resolve such issues. Although donors are willing to invest, local kinship power plays a huge role in implementing these reforms because farmers are linked to their local power dynamics. Therefore, we should bring local research based reforms.

Questions and Answers

The panelists were asked how we can make water as a human right issue at a grassroots level? Ms. Daanika answered that human rights is one area where there is a unilateral agreement universally. When pressure comes from a global point of view then people think let's do something about it. She mentioned that the step taken by Leila is very symbolic and has gone to the ministry level. Hence, a lot of noise has been made and thus it got the attention that it needed. Another question on water equity and small farmer rights was raised.

Mr. Daanish Khan replied that the most powerful especially in Balochistan have tried to take control of the water system there. In Sindh as well, during floods, water was diverted to other lands to protect their land. Same thing has happened in Australia as well, equity in terms of water distribution is very important. He suggested that even in activism, water equity should be at the forefront.

Conclusion

Mr. Fawad Soomro concluded that he was impressed by everyone's contribution. He added that the nature of the discourse on water and natural resources needs to be changed. The mindset that nature is out there for our benefit, that needs to be changed. We need to give more respect to nature and have to change this fundamental view. Agency

Mr. Fawad Soomro concluding the session with his remarks on role of youth in climate change

comes automatically and naturally to young people and that's where the future and discourse on sustainable and inclusive solutions can be found. The session was brilliant and touched upon many aspects of the problem and where youth is engaged.

Mr. Tofiq Pasha Mooraj thanked everyone and asked everyone to continue their efforts and contributions.

Conference Proceedings

Closing Plenary – Moving Forward in the 21st Century

Session 8 - Closing Plenary

Facilitator	**Ms. Sanaa Baxamoosa,** General Manager, Hisaar Foundation
Chief- Guest	**Mr. Imran Ismail,** Governor Sindh
Presenters	**Dr. Adil Najam,** Professor Dean, Boston University
	Ms. Mina Dowlatchahi, FAO Representative in Pakistan
	Mr. Ilangovan Pachamuthu, Country Director, World Bank
	Ms. Meher Noshirwani, Governor, Hisaar Foundation
	Ms. Simi Kamal, Founder and Chair Academic Committee, Hisaar Foundation
	Ms. Nadira Panjwani, Chairperson, Panjwani Charitable Foundation
	Dr. Sarosh H Lodi, Vice Chancellor, NEDUET
	Mr. Ashraf Kapadia, Chairperson, Hisaar Foundation

Session audience

The session was sponsored by Hisaar Foundation and Engro Foundation

Opening remarks

Ms. Sanaa Baxamoosa welcomed guests to the closing plenary of the 4th KIWC. The conference had been a resounding success, she said, with the Hisaar Foundation again achieving what it had set out to do since the first conference in 2013. What had started out as a group of con-

Ms. Sanaa Baxamoosa hosting the closing plenary

cerned, dedicated professionals had now blossomed into something very significant. She added that Hisaar Foundation is committed to reducing the consumption of single use plastics and had taken special measures to make this conference event plastic free.

Ms. Mina Dowlatchahi speaking on meeting the challenges of WEF Nexus

Meeting the Challenges of The Nexus - What we need to do

Ms. Dowlatchahi, said that the 4th KIWC was proof that policy-makers and stakeholders were waking up to the issues facing Pakistan, with water management taking center stage with the dual menace of an increasing population and Climate change not far behind. Ms. Dowlatchahi said achieving Pakistan's SDG commitments could only be fulfilled if policy-makers understood the importance of the WEF nexus. Solutions must be found for outdated agriculture practices, and those most affected must adapt to changing realities; there must be policy alignment between water, food, energy, agriculture and the environment with institutions and stakeholders working together.

Mr. Ilango Pachamuthu presenting on World Banks initiatives for improving water governance

Partnering Sindh in Improving Water Governance

Mr. Ilango Pachamuthu emphasized the importance of the World Bank's engagement in Pakistan, 60% of which is in agriculture. It is now looking to improve Pakistan's water infrastructure to combat increasing scarcity so coming generations are not affected. Mr. Pachamuthu said that other countries have similar challenges, many have less water but bigger economies, and Pakistan must adapt through institutional upgrades, better research and development, reducing subsidies, cost recovery (the Abiana system needs fixing), and greater private public engagement. He said that there is crop diversification: the Bank is helping farmers to explore high value markets available for fruit and vegetables through better agricultural practices.

Mr. Pachamuthu ended by saying steps are needed to accelerate growth, modernization and diversifi-

cation towards renewables, and the energy sector also needs attention. Circular debt is undermining the energy sector and an area of great concern. With greater investment in renewable energy, Pakistan's energy could be a 60% mix by hydro, wind, solar by 2030. He also spoke on building WAPDA's ability to explore financing concepts.

Dr. Adil Najam highlighting why climate change has become a water challenge

Why Climate Change has Become a Water Challenge

Dr. Adil Najam termed the 4th KIWC an excellent learning experience which presented the 'Big Picture' about climate change, what it means for individuals and countries and why a culture of adaptation is necessary. It's already happened, he warned, and we need to act!

He went on to describe the planet as a country, divided among the have and the have-nots, with the latter in danger of suffering the most from climate change while contributing the least to the phenomenon. Therefore, managing climate change requires good governance across a degraded, angry planet; the expected rise in global temperature will not be 1.5 centigrade as expected but may hit the 2 centigrade mark and this will have devastating impacts he cautioned.

Ms. Nadira Panjwani introducing the Panjwani-Hisaar Water Institute

Unveiling the Dream - Panjwani Hisaar Water Institute

Ms. Nadira Panjwani introduced the Panjwani-Hisaar Water Institute, which focuses on building research, linkages and partnerships to better inform water management systems in Pakistan. PHWI is a collaborative initiative which reflects synergies of common interests. She added that the Panjwani Charitable Foundation is dedicated to human development in Pakistan, and they take great pride in being the lead donors for the institute, which is of strategic importance to citizens and the generations to come. She hopes that PHWI brings attitudinal and behavioural change regarding water in Pakistan, and thanked Hisaar Foundation and NED for their commitment, encouragement and partnership.

Dr. Sarosh Lodhi, Vice-Chancellor of NED added that the university hopes to provide the best quality human resources to help secure the future of the country.

Spotlight on Youth in Climate Action

Mr. Zohair Ashir introduced Ms. Leila Alam, a young student from Lahore who petitioned the courts in Lahore for understating the levels of smog and air quality in the city. She passionately addressed the audience, stating that the smog has taken away her right to be a child.

Ms. Leila Alam speaking on youth and climate action

Her statement was followed by tokens of appreciation presented to all sponsors of the conference by Mr. Imran Ismail, Governor of Sindh.

Chief Guest for the Closing Plenary, Mr. Imran Ismail, Governor Sindh speaking government initiatives for water provision

Address by Chief Guest

The Chief Guest for the Closing Plenary, Imran Ismail, Governor of Sindh emphasised the need for the government to work with citizens at the community level to enhance awareness and present solutions to the current water crisis. He commended Hisaar Foundation for the completion of a successful water conference, and said that making waste water useful is the need of the hour. He noted that the federal government had decided to set up desalination plants in various areas of the metropolis and the arrangements for the purpose were in final stages, and added that the Karachi package announced by the Prime Minister also included a plan to provide pure clean drinking water to the citizens, according to a statement. The governor said that the present government wanted to tackle the issue of clean drinking water in the country on a priority basis and in this regard work on K-IV project was underway to ensure the supply of water to the citizens of Karachi. He added the present government was committed to ensuring the implementation of the national water policy so that a better water supply system could be established in each province, and assured full support on behalf of the Federal Government for this cause.

Mr. Ashraf Kapadia concluding the conference

Closing Remarks

The closing remarks were given by Ashraf Kapadia, who thanked the speakers, panellists, and participants for their time and contributions. The plenary closed with a call for the 5th Karachi International Water Conference, scheduled for November 2021.

Closing ceremony

Preconference Events

Women's Colloqium - Islamabad

Women's Colloquium

The preconference events kicked off with the Women's Colloquium event co organized by Aurat Foundation at its head office in Islamabad on 3rd August 2019.

Ms. Mumtaz Mughal, Director Programs, Aurat Foundation welcomed the participants and explained the objective of the event was to engage organizations and women individually who are active in the areas of water and sanitation, sustainable development, women's participation and empowerment. She stressed that women as active leaders, partners, experts and agents of change in water are highly appreciated to join.

Ms. Simi Kamal, Chair Academic Committee, Hisaar Foundation spoke about Global Trends in Water and the Role of Women. She highlighted that women are the primary users and managers of water but have no control over decision making and this has to change, the woman and water nexus has to be acknowledged and a gender-responsive planning for the water-energy-food (WEF) nexus is required where differentials among men and women in the water, energy and food sectors are addressed. Ms. Kamal shared profiles of global, regional and local women water leaders and their significant contributions in the water sector.

Ms. Farzana Saleem, former country manager of CapNet Pakistan, spoke on Gender and IWRM and introduced the work of Women's only strategic initiative of Women and Water Network (WWN). An initiative of Hisaar Foundation, WWN has been operational in Pakistan since 2001 and has sever-


Women's Colloqium - Islamabad

al chapters across urban and rural areas. WWNs bring in women from all sectors of society, such that their voice can be effectively channeled into mainstream policies, discussions and actions relating to water, food and livelihood issues. The WWN networks have been actively involved in advocacy and intervention programs and with their engagement water conservation training have been provided to more than 400 school teachers and over 9,000 students to date.

WWN Islamabad Chapter was also launched at this event.

All 40 women present at the event have joined the WWN Islamabad. The participants included representatives from academia, public offices, civil society, law, media, individual experts, and representatives of women alliances.

Similar events were held at Quetta, Lahore and Karachi in collaboration with the Aurat Foundation. Each chapter formed in these cities formed their own committees and will soon be meeting to set out its own action plan.

The discussions, learnings and conclusions from these colloquiums formed a part of the conference.

Women's Colloqium - Lahore

Select women from these events were later supported by the World Bank to be a part of the conference as representatives of their provinces and of their respective chapters.

Youth Jamboree Panelists

Youth Jamboree

A youth jamboree pre conference session was organized at NED University, Karachi on 22 November 2019, to spread awareness in our youth regarding the complex relationship between food, water and energy and the gaps that exist in the system. The Jamboree aimed to have a dialogue revolving around climate change and sustainable development goals, where young speakers were invited to share the work they are doing along with their perspectives on not just the nexus itself but to also talk about the global climate emergency.

The jamboree was supported by the outreach partner, Open Mic.

The panel discussion began with Ms. Asra Rizwan, Founder and strategic lead of OpenMic who talked about the importance of youth activism and how the spirit of volunteerism should be the guiding star for our youth. Mr. Safee Ul Haque, Project Director, VCAST sustainability dialogue spoke on the

Women's Colloqium - Karachi

significance of asking the right questions and creating avenues for dialogues within our own communities. Ms. Emaan Danish. Pakistan's youngest eco-preneur shared her project of sustainable dolls for young kids. Mr. Hussain Bux, Research Associate for Social Science, covered the issues of food insecurity in Pakistan. Mr. Fawad Soomro, Head of Engro Foundation, discussed the WEF nexus and centrality of water in solving the challenges in Pakistan. Other young activists and speakers Mr. Ahmed Shabbar, Founder of GarbageCAN, Ms. Sehr Karimjee, Design Engineer, Reon and Ms. Ramsha Zulfiqar, SMB Fatima Jinnah, spoke on climate change and youth led activism.

Over 60 students and professionals attended the event hosted at the NED University Karachi. The majority of the audiences were young students from schools namely, Dawood Public School, Khatoon-e-Pakistan, SMB Fatima Jinnah School, from Karachi University, NED University, Iqra University and Szabist.

Acknowledgements from Conference Director

Organizing an international conference, with 13 sessions, 70 speakers and 1200 participants is a mammoth task that requires months of effort, time and dedication. It goes without saying that this conference would not have been possible without the support of our generous sponsors, particularly Engro Foundation who have consistently lent us their support since the 2015 conference. All 15 sponsoring organizations played an integral role in enabling the team at Hisaar Foundation to bring the conference together and deliver it with seamless perfection. Each of these 15 sponsors has been individually mentioned at various places in this report.

Without a doubt, their contribution and support made this conference possible, however, I would like to take this opportunity to thank and acknowledge the backstage "crew" if you will. These are the people who worked tirelessly for months on end to deliver the biggest and best international water conference that they could produce and deliver.

First and foremost, I would like to thank Mr. Zohair Ashir, Mr. Ashraf Kapadia and Ms. Simi Kamal, the respective chairs of the Steering Committee, Management Committee and Academic Committee for their invaluable guidance, time, input and support at every step of the way.

I would also like to thank Mr. Yasir Herekar and his team at Jump Activations, particularly Ms. Nasreen Bokutz for the excellent conference execution and event management and Mr. Gibran Mir for the creative content. Mr. Herekar and his team created a very unique ambience and provided a valuable support system that helped us in delivering the 4th Karachi International Water Conference: Water-Energy-Food Nexus efficiently and effortlessly.

Thanks also to the Starlinks team who managed the social media and the PR for the conference.

Thank you to Ms. Seema Taher Khan and her team at News One/TV One who provided us the videographers, on a gratis basis.

I would like to thank Mr. Danish Khan of Alif Design who developed the conference logo, infographics and worked tirelessly with me to produce this report and the 2017-2018 programme report of Hisaar Foundation.

I would also like to thank the dedicated staff at Hisaar Foundation who provided the backbone of the Conference Secretariat. I would particularly like to mention Ms. Daniya Khalid who served as Secretary for the Management and Steering Committees and generally managed the secretariat and social media aspects. I would like to thank Mr. Nadeem Siddiqui who helped with the mailing lists and provided overall office support and Mr. Aatir Jilani who managed the conference accounting. I would particularly like to thank Mr. Ahmed Palwa who ensured that Hisaar Foundation's projects and programmes continued running smoothly in parallel. I would like to thank Ms. Sameen Huda, Ms. Geeta Khatri and Ms. Zainub Alam, our conference assistants who provided invaluable support and assistance to the conference secretariat team. I would also like to thank Mr. Wasif Rashid, Mr. Ashok Kumar, Sirajuddin Khan and Siraj Mullah who provided critical support before, after and during the two days of the conference and were integral members of the conference logistics team. I would also like to thank Ms. Kausar Hashmi and Mr. Uris Umrani who managed the affairs of the Academic Committee including management of the reporters and session details. Finally, a big thank you to all the chairs, co-chairs, facilitators, speakers, reporters and volunteers who provided crucial support during the two days of the conference. See you all in 2021!

Sanaa Baxamoosa

Conference Director

About Hisaar Foundation

Hisaar Foundation (a foundation for water, food and livelihood security) is a not-for-profit, voluntary citizens' body set up in 2003 (under section 42 of the Companies Ordinance 1984) and completes seventeen years at the end of this year. Hisaar Foundation is led by a visionary and dedicated Board of Governors that hail from many disciplines and diverse professional backgrounds who steer the Foundation's strategic initiatives and anchor its project and programmes on the ground.

Hisaar Foundation is a thought leader that strives to inspire action and demonstrate solutions in the water sector. Committed to SDG 6 on water, the Foundation inspires action through a 4 pronged approach: encouraging innovation and research in the water sector through the first of its kind Panjwani-Hisaar Water Institute; assisting the government on policy and strategy through the The Think Tank on the Rational Use of Water ; sharing of knowledge and linking research and practice through the Universities for Water Network and demonstrating solutions and actions through its Programmes and Projects that are relevant to the water-food-livelihood nexus.

Conference giveaways - "Going green" planters

Hisaar Foundation has established itself as a premier organization on water with its strategic initiatives such as the Panjwani-Hisaar Water Institute,

Hisaar Foundation Stall

the Think Tank on the Rational Use of Water, the Universities for Water Network and the Karachi International Water Conference which is held every two years. The Panjwani-Hisaar Water Institute will be the first of its kind interdisciplinary and multidisciplinary research institute dedicated to water. The Think Tank on the Rational Use of Water works on policy and strategy, the Universities for Water Network links research and practice and the Karachi International Water Conference provides a unique and neutral platform for water stakeholders from all sectors. Hisaar Foundation also continues to enhance and strengthen its programmes that focus on building partnerships, providing emergency support when needed and developing and providing low-cost solutions with relevance to Integrated Water Resources Management and the water-food-livelihood nexus.

Hisaar Foundation is also engaged in work at the grassroots level through its three programmatic

streams of creating partnerships for change; developing solutions; and emergency support. Over the past 17 years Hisaar Foundation pioneered novel concepts of Area Water Partnerships, Women and Water Networks, Cost Synergy and Mutual Accountability. It has also demonstrated many viable solutions on the ground: Project Aab focused on rehabilitation of flood affected communities through the Total Water Solution model and installation of water systems all across Pakistan. Project Aab o Daana focused on domestic water and training for food produce in small urban spaces and rural areas. Project Aab e Thar focuses on both water and food security in desert areas which includes rainwater harvesting storage ponds, new and rehabilitated deep dug wells, hand pumps and boreholes. The Adopt a Village program develops holistic and comprehensive disaster mitigation capabilities and builds resilience through provision of water solutions, kitchen gardening trainings, livestock distribution, fodder tree plantations, ber grafting and solar household solutions.

Hisaar Foundation has extensive linkages with international partners such as CapNet (International Network for Capacity Development in Sustainable Water Resources Management), Global Water Partnership, International Water Management Institute, and South Asian Consortium for Interdisciplinary Water Resources Studies (SaciWATERs), as well as banks, corporate entities, civil society organizations and grassroots NGOs in Pakistan. Since January 2018, Hisaar Foundation has made steady progress and development towards realizing the goal of establishing the Panjwani-Hisaar Water Institute at NED University. In addition, the completion and dissemination of the Implementation Framework of the National Water Policy developed by members of the Think Tank on the Rational Use of Water is a critical development and a significant contribution from Hisaar Foundation to assist the government of Pakistan in formulating its policies on water.

Hisaar Foundation conference team

Conference Coverage and Participation

Hisaar Foundation wishes to thank our sponsors whose support and encouragement made it possible for us to hold the 4th KIWC. The conference sponsors reflected a wide range of social development and corporate sector organizations. As in the past, Engro Foundation continued as lead sponsor for the 4th KIWC as well.

Sponsors	Media Partner	Conference Exhibitors
Engro Foundation	Tv One	Engro Foundation
Hashoo Foundation	News One	Hisaar Foundation
ATC Holdings	Waseeb	LEAD Pakistan
Food and Agriculture Organization	FM 91	Aurat Foundation
World Bank		Food and Agriculture Organization
International Water Management Institute		ATC Holdings
United Bank Limited		Invency/Pak Vitae
Australian High Commission to Pakistan		OXFAM Pakistan
CapNet Global		WWF Pakistan
Aurat Foundation		
Oxfam Pakistan		
Thardeep Microfinance Foundation		
HUBCO		
RAASTA Development Consultants		
AASA Consulting		

Social Media

The 4th KIWC provided a forum for sharing knowledge, discussing ideas, exchanging information, and learn about cutting-edge research in Pakistan in the context of the water-energy-food nexus to a larger audience through its social media platform. The social media strategy utilized, Facebook, Twitter, Youtube, Hisaar Foundation and KIWC websites. To integrate the campaign, two official conference hashtags were introduced #4KIWC ,#KIWC2019 and #WEFNEXUS. Hisaar Foundation engaged Starlinks PR and Events to manage overall PR and increase social media engagement before and during the conference.

Facebook: facebook.com/hisaarfoundation

Hisaar Foundation Facebook page had over 15,400 followers during the conference. The 4th KIWC event campaign featured, introducing Hisaar foundation and its projects and programs, flashback of previous conference events, information regarding the conference formats and sessions, revealing the

hashtags, featured speaker posters, highlighting the conference sponsors, as well as regular information on water news and issues that the region faces. During the conference the posts had an increased reach of. A picture gallery of the conference is also available on the Foundation's Facebook page.

The whole conference was broadcasted live through the medium of facebook live and provided a wide range of audience with access to the conference sessions and discussions.

Twitter: @HisaarF

Hisaar Foundation Twitter page was the focus for promoting 4th KIWC, engaging attendees in conversation, and running a high-visibility event. The conference tweets earned over 32,264 impressions. The hashtags #4KIWC ,#KIWC2019 and #WEFNEXUS were used for engaging the twitter users for the conference. Leading up the conference, all the major highlights of the conference, its speakers, participating organizations and further details of the program was extensively tweeted. During the conference, the social media team provided live video coverage of the sessions along with the tweets..

Youtube:

Hisaar Foundation Youtube channel provided exclusive coverage of the event. The youtube account featured videos on Hisaar Foundation and its programs along with interviews with the speakers and


LEAD Pakistan Exhibition Area Stall

Conference Coverage and Participation

their views about the conference. The channel had featured presentations, discussions and dialogues of renowned speakers on the water, energy and food nexus.The channel also displays post conference coverage by various television media channels.

Website: www.waterconf2019.hisaar.org

The 4th KIWC website was the prime source of information for all interested in attending the conference. The website featured details on the conference themes, format, delegates, the youth competitions, submission of abstracts as well as details on the online registration process. A speakers list was also displayed on the website along with the sponsor and participating organizations. The website also serves as an archive for pre conference events, post conference coverage. The pictures, papers and presentations and the conference declarations are all available on the website.

Media coverage

The 4th KIWC was extensively covered by both the electronic and print media, with the conference proceedings reported in their respective news channels, newspapers and other programs. More than 90 representatives from the media participated in the conference over both days.

Conference Mementos

Electronic Media

Cliff Pakistan	Starlink	KTN News
Zameen	Airwaves Media	MAC News HD
Biz Today	PTV News	News one
Asia Net Pakistan	92 News	TV One Pakistan
Biz Today Intl	Dunya News	NEO TV

Print Media

Dawn	Daily Jang	Daily Khabrain
Daily ausaf	92 Newspaper	Regional Times
Roznama Dunya	Radio Pakistan	Daily Messenger
Jehan Pakistan	Nai Baat	Urdu Point
Nawa-I-Waqt	Daily National	The Nation
Daily Pakistan	Daily Jurrat	The News

Conference Participants

Over 1255 participants attended the conference representing a diverse and rich variety of stakeholders.The conference brought together a wide selection of water sector experts and professionals and reached out to non-traditional players. The event was attended by international speakers from Cap-Net ,International Water Management Institute (IWMI) ,WorldBank ,Food and Agriculture Organization (FAO), Australian Awards Alumni, Commonwealth Scientific and Industrial Research (CSIRO),Water Integrity Network and Australia Department of Foreign Affairs & Trade.It was attended by large number of renowned Government representatives and heads of water management institutions.Corporate leaders, members of academia, representative of donor agencies, professional bodies, member of women and water networks and representatives of community based organizations also participated in the conference.The 4th Karachi International Water conference was also attended by University and Research Organizations,International water organizations and Non Governmental Organizations. Media representatives, partners of Hisaar Foundation,youth and students organizations, water related manufacturers and service providers also participated

Conference Committees

Credits

Editor
Ms. Daniya Khalid

Contributing Editor
Ms. Sanaa Baxamoosa

Reporters

Ms. Farwa Hussain
Ms. Daanika Kamal
Mr. Wasif Rashid
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Sanaa Baxamoosa
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Mina Dowlatchahi
Dr. Barbara Schreiner
Zohair Ashir
Ashraf Kapadia
Wasif Rashid

Conference Programme Day 1

Tuesday, 26th November 2019

Time	Session & Topic	
0900 - 0930	Registration	
0930 - 1130	**Session 1:** Opening Plenary Water, Energy and Food Nexus – Agenda for 21st Century **Room No:** CBR **Format:** Plenary	
1130 - 1200	Tea Break	
1200 - 1330	**Session 2A** Valuing Water - Harnessing Energy + Food Production **Room No:** CBR **Format:** Plenary	**Session 2B** Leaving No One Behind – Café for the Unheard **Room No:** Ambassador III **Format:** Open dialogue between experts & participants
1330 - 1430	Lunch	
1430 - 1600	**Session 3A** Water Governance & Security-Saving Urban Water from Urban Decay **Room No:** CBR **Format:** Panel Discussion	**Session 3B** Indus and Murray Darling Basin – a shared experience of reform under a changing climate **Room No:** Ambassador III **Format:** Panel Discussion
1600 - 1615	Tea Break	
1615 - 1800	**Session 4A** Water Infrastructure and Investments - 'Who' Gives a Dam **Room No:** CBR **Format:** Panel Discussion	

Conference Programme Day 2

Wednesday, 27th November 2019

Time	Session & Topic	
0930 - 1100	**Session 5** Fireside Chat on Valuing Water **Room No:** CBR **Format:** Fireside chat with two leading personalities one from Pakistan and one from abroad	
1100 - 1130	Tea Break	
1130 - 1300	**Session 6A** Water Governance & Security – Food Production and Agriculture Development **Room No:** CBR **Format:** Panel Discussion	**Session 6B** Nexus Approaches for Water Policy and Strategy **Room No:** Ambassador III **Format:** Panel Discussion
1300 - 1400	Lunch	
1400 - 1530	**Session 7A** Water Infrastructure and Investment – A Bespok Model for Water Financing **Room No:** CBR **Format:** Key Note Speaker, Panel Discussion	**Session 7B** Leaving No One Behind – Young People Calling for Climate Emergency **Room No:** Ambassador III **Format:** Interaction with audience
1530 - 1545	Tea Break	
1545 - 1730	**Session 8** Closing Plenary **Room No:** CBR **Format:** Closing plenary	

Appendix - B

List of Presentations and Distribution Materials

Session 1

Opening Plenary: Water, Energy and Food Nexus-Agenda for the 21st Century

Presentation on the Purpose of the Conference in the Context of the WEF Nexus by Miss Simi Kamal

Presentation on the Water in Pakistan: Challenges and Potential Solutions by Ghias Khan, Engro Corporation

Presentation on the Perspectives on the Water, Energy and Food Nexus -- Agenda for the 21st Century by Mr Roberto Lenton of Nebraska University

Session 2A

Valuing Water –harnessing energy and food production

Presentation on Nexus In Practice; More With Less by Abida Farooqui,Quaid e Azam University

Presentation on Australia to Collaborate with Pakistan on Water, Food and Energy Nexus by John Dore (Australian Govt)

Presentation on Thousands have Lived Without Love; Not One Without Water by Shahid Lutfi (ATC Holdings)

Video Presented on the Edge of the Delta-Water, Life, Mangrove, Commerce by Tariq Qaiser (Architect)

Session 3A

Water Governance and Security-Saving Urban Water from Urban Decay

Presentation on Urban Water Management -- A Transformation Strategy for KWSB by Daniya Khalid

Presentation on Urban Water Management-- Experiences from around the World & Pakistan by Farhan Sami (WorldBank)

Presentation on the dead in the water –The story of Karachi's K-IV mega project by Mahim Maher (Samaa Digital)

Session 3B

Indus and Murray Darling Basin –A Shared Experience of Reform

Presentation on Australia to collaborate with Pakistan on water, food and energy nexus by Jhon Dore (Australian Govt)

Presentation on Geography, Hydrology, Development Approach, Services by Dr Zaigham Habib (Hydrologist)

Presentation on Current water management cooperation between Australia and Pakistan by Mobin Ahmed and John Kirby (CSIRO)

Presentation on The Murray Darling Basin by Paula Richardson(Australian Govt)

Distribution of materials related to History of the Murray Darling Basin and Murray-Darling Basin's importance to Australia by John Dore

Session 4A

Water Infrastructure and investments-'Who' Gives a Dam

Presentation on Global Trends and Observations on Large Dams by Dr WIlliam Young

Presentation on water infrastructure & investment - 'who' gives a dam- role of Wapda going forward by Shahid Ahmed (civil engineer)

Presentation on Putting Nature to Work Integrating

Green & Gray Infrastructure by Hammad Naqi

Presentation on Role of Infrastructure in Management of Water by Sardar Mohd Tariq

Session 4B

Does the Nexus Actually Work? Women's Perspective

Presentation on history of water and women network in Pakistan by Farkhunda Aurangzaib

Presentation on Global Trends in Water and the Role of Women by Meher Noshirwani

Presentation on Women and Water Networks – Pakistan by Mumtaz Mughal

Presentation on Hisaar Foundation, Women and the WEF Nexus by Sanaa Baxamoosa

Session 6A

Water Governance and Security- Food Production and Agriculture Development

Presentation on Climate Smart Agriculture in Pakistan FAO experiences by Banaras Khan (FAO-Pakistan)

Presentation on Greening Growth and Policies Evidence from a Pilot on "Green" Rice Cultivation by Dr Mahmood Ahmed (FAO-Pakistan)

Presentation on FAO's approach to the Water-Food-Energy nexus by Jippe Hoogeven (FAO-Rome)

Session 6B

Nexus Approaches for Water Policy and Strategy

Presentation on Linking Global, Regional and National Level Water Strategies by Hafeez Hissar

Presentation on An Exploratory Study of Akram Wah Canal Command Area, Sindh by Khurshid Akram

Presentation Citizens' Efforts at Water Policy by Sanaa Baxamoosa

Session 7A

Water Infrastructure and Investment –A Bespoke Model for Water Financing

Presentation on financing Pakistan's water infrastructure by Ali Ansari (X-Petroleum)

Presentation on Water Infrastructure and Investment – The Challenge of Corruption by Barbara Schreiner (WIN)

Presentation on commercial financing for public hydropower projects by Rikard Liden (World Bank)

Presentation on Water Infrastructure and Investment by Zohair Ashir

Session 7B

Leaving No one Behind-Young People Calling for Climate Emergency

Presentation on Shape of Water by Areej (Student)

Presentation on Trash it by Trash it team

Session 8

Closing Plenary: Moving Forward in the 21st Century

Presentation on Why climate change has become a water challenge by Dr. Adil Najam. Professor Dean, Boston University

Presentation on Meeting the challenges of the Nexus – What we Need to do by Mina Dowlatchahi, FAO

Video Presented on the Unveiling the Dream by Simi Kamal

Appendix - C

Chair, Speakers, Panelists and other Featured Participants

Mr. Abdul Majid, ICARDA	Mr. Mahmood Ahmad, BIPP
Ms. Abida Farooqi, Quaid-e-Azam University	Mr. Mayura Botejue, Renewable Energy Consultant
Dr. Adil Najam, Boston University	Ms. Meher Marker Noshirwani, Hisaar Foundation
Mr. Adnan Asdar, Multinet	Ms. Mehnaz Nadeem Karamat, OAKS
Ms. Afia Salam, Indus Earth Trust	Ms. Mina Dowlatchahi, FAO
Mr. Ahmed Kamal, Federal Flood Commission	Mr. Mobin-ud-din Ahmad, CSIRO
Mr. Ahmed Rafay Alam, Hisaar Foundation	Mr. Mohammad Arshad, AMU
Mr. Aliuddin Ansari, X Petroleum	Mr. Mohsin Hafiz, IWMI Pakistan
Mr. Arif Alvi, President of Pakistan	Mr. Muhammad Qazilbash, Oxfam Pakistan
Mr. Arif Usmani, National Bank of Pakistan	Dr. Nausheen Anwer, KUL IBA
Mr. Ashraf Kapadia, Hisaar Foundation	Dr. Noman Ahmed, NEDUET
Ms. Ayesha Khan, Hashoo Foundation	Ms. Nadira Panjwani, Panjwani Charitable Foundation
Mr. Azeem Shah, IWMI Pakistan	Dr. Nausheen Anwer, KUL IBA
Mr. Banaras Khan, FAO Pakistan	Ms. Nazia Nur, Australian High Commission
Ms. Barbara Schreiner, Water Integrity Network	Dr. Noman Ahmed, NEDUET
Ms. Daanika Kamal, The Colour Blue	Ms. Paula Richardson, Australian High Commission
Mr. Danish Khan, Hisaar Foundation	Mr. Pervaiz Amir, Hisaar Foundation
Ms. Daniya Khalid, Hisaar Foundation	Mr. Reza Baqir, State Bank of Pakistan
Mr. Ehsan Leghari, Government of Sindh	Mr. Ricard Liden, The World Bank
Mr. Farhan Sami, The World Bank	Mr. Roberto Lenton, University of Nebraska
Ms. Farwa Hussain, Habib University	Dr. Robina Wahaj, FAO Pakistan
Mr. Favad Soomro, Engro Foundation	Ms. Rija, Climate Action March
HE. Geoffrey Shaw, Australian High Commission	Dr. Sarosh Hashmat Lodi, NEDUET
Mr. Ghias Khan, Engro Corporation	Mr. Samar Ali Khan, SIDCL
Ms. Granaz Baloch, University of Turbat	Ms. Sanaa Baxamoosa, Hisaar Foundation
Mr. Hammad Naqi Khan,WWF Pakistan	Mr. Sardar Tariq, PWP
Mr. Hassan Abbas	Ms. Seema Taher Khan, News One
Mr. Ilango Patchmathu, World Bank	Mr. Shahid Ahmed, WAPDA
Mr. Imran Ismail, Governor of Sindh	Mr. Shahid Ali Lutfi, ATC Holdings
Mr. Jamal Ansari, Akbar Associates	Ms. Shehla Batool, Quaid-e-Azam University
Mr. Javed Syed, Invency Private Limited	Ms. Simi Kamal, Hisaar Foundation
Mr. Jippe Hoogeveen, FAO	Mr. Syed Mahmood Nawaz Shah, Hisaar Foundation
Mr. John Dore, DFAT	Mr. Tariq Qaiser, Architect
Mr. John Mac Kirby, CSIRO	Mr. Tofiq Pasha Mooraj, Hisaar Foundation
Ms. Kausar Hashmi, NEDUET	Mr. Umer Karim, FAO Pakistan
Mr. Khalid Mohtadullah, Hisaar Foundation	Mr. Wasif Rashid, Hisaar Foundation
Mr. Khurshid Akram, Oxfam	Dr. William Young, World Bank
Ms. Leila Alam, Youth Activist	Mr. Zohair Ashir, Hisaar Foundation
Ms. Mahim Mahar, Samaa Digital	Dr. Zaigham Habib, Consultant Hydrologist and Water Resources


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a foundation for water, food and livelihood security


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Organization of the
United Nations


HASHOO
FOUNDATION
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Management Institute


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